THE ASTRONOMICAL METHOD AND ITS APPLICATION TO THE CHRONOLOGY OF ANCIENT INDIA

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BEING THE RAO BAHADUR BAPU RAO DADA KINKHEDE LECTURES DELIVERED AT THE NAGPUR UNIVERSITY ON THE 13TH, 14TH, 15TH AND 16TH NOVEMBER, 1940

BY

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AUTHOR'S PREFACE

THIS work was prepared in response to the invitation of the Nagpur University to deliver the Bapu Rao Dada Kinkhede Lectures for the year 1940; that explains its present form. The researches embodied in this volume are virtually the result of a life-long study and were originally published long ago in the form of essays in various Marathi Journals. My Marathi essay on the date of the Mahābhārata War, which is the foundation of my further researches in this field, was published in the *Vividha Jñana Vistāra* (विविधज्ञानविस्तार) in 1920 under the caption " Mahābhārateeya-Yuddhakāla-Nirṇaya". It will be proper here to mention that the manuscript of this essay was read by the late Lokamānya Tilak and that he had at that time expressed his favourable opinion about it in a letter to Dr. Moonje. The letter is reproduced below:—

Yavat, 1st September 1915.

MY DEAR MOONJE,

I have read and re-read Mr. Daftari's MSS. essay. The conclusion is in my opinion sound. But I don't agree with certain suggestions by which he tries to explain away the texts contrary to his view. He has, no doubt, worked for himself and his essay contains some entirely new suggestions. Will he not translate it into English? I should advise him to do so and publish (it) in some Oriental Journal. I shall return the copy to you with my remarks in about a fortnight. I have leisure enough at this place for that.

Yours sincerely,
BAL GANGADHAR TILAK.

It is unfortunate that the author of the *Orion* and *The Arctic Home in the Vedas* did not find though he wished, leisure enough to make notes on my manuscript

copy. Nor had I the leisure to carry out his suggestion that the essay should be translated into English. It was sometime in 1936 that Dr. W. S. Barlingay again revived the idea that these researches should be placed before Western Scholars and Indian Scholars in other provinces of India, but at that time again I was disinclined to make any efforts in this direction on the grounds of health. Early in 1939, however, the Kinkhede Lectures Committee invited me to deliver the Kinkhede Lectures for the year 1940 and though I was at first disinclined to accept the invitation, the persuasions of the Mohani brothers and Dr. Barlingay ultimately prevailed and the result is the present work.

In preparing this volume I received very valuable help from my preceptor Śreeyuta S. K. Barlingay, his son Dr. W. S. Barlingay, PH.D., Bar-at-Law, my friend Mr. H. K. Mohani, Tarkateertha Laxman Śastree Joshi, Editor, *Dharmakosha* and Dr. N. G. Shabde, M.A., D.SC. (Edinborough), Professor of Mathematics, Science College, Nagpur, and I take this occasion to thank them all very heartily.

The Vice-Chancellor of the Nagpur University, Mr. T. J. Kedar, allowed me free use of the University Library, for which I am very much thankful to him. I also thank the R. B. Bapu Rao Dada Kinkhede Lectures Committee and especially R. B. Madhava Rao Kinkhede for having invited me to deliver these lectures.

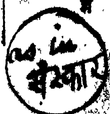
Lastly, I shall feel my labours amply rewarded if students of Ancient Indian Chronology find this work helpful to them; and any suggestions from them as regards the subject-matter of my thesis will be most welcome.

NAGPUR,
1-1-1942.

KESHEO LAKSHMAN DAFTARI.

Alphabet used for Transliteration

अ	a
आ	â
इ	i
ई	ī or ee
उ	u
ऊ	ū
ऋ	ṛi
ॠ	ṛī
ऌ	ḷi
ए	e
ऐ	ai
ओ	o
औ	au or ou
क्	k or c
ख्	kh
ग्	g
घ्	gh
ङ्	ṅ
च्	ch
छ्	chh
ज्	j
झ्	jh
ञ्	ñ
ट्	ṭ
ठ्	ṭh
ड्	ḍ
ढ्	ḍh
ण्	ṇ
त्	t
थ्	th
द्	d
ध्	dh
न्	n
प	p
फ्	ph
ब्	b
भ्	bh
म्	m
य्	y
र्	r
ल्	l
व्	v
श्	ś
ष्	sh
स्	[illegible]
ह्	h
ळ्	ḷ
द्ध	ddh or dh
ः	ḥ
क्ष्	[illegible] or csh
ज्ञ	



Errata et Corrigenda

page	line	incorrect	correct.
5		verse	verse 28
14		n	in
76		2·53	29·53
17		is 5 that	is that
9		eally	really
2			
59			
4		nformation	information
1		दुद्यत	दुर्धृत
4.			
3	Idmawāhas		Idhmawāhas
2	perormed		performed
5	montts		months
8	d s		days
~~0~~	~~that~~		~~that~~
3			
4	interchanged		interchange
2	सप्त		सत

SYNOPSIS

(*The numerical figures indicate paragraphs*)

LECTURE I

OUR OBJECTIVE, METHOD AND DATA

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or

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LECTURE I

OUR OBJECTIVE, METHOD AND DATA

LECTURE 1

OUR OBJECTIVE, METHOD AND DATA

1. The history of Ancient India is a mass of events without chronology. Events without chronology give us little historical information. Let us take an illustration. Suppose we know, as we will do hereafter, that the Indians took three years of 360 days each and the fourth of 381 days but every 112th year of 380 days only. This gives us little information of any value unless we know when this system was in vogue. But if we know that it was in vogue in 3102 B.C., it gives us precise historical knowledge to the effect that the Indians were so much advanced in civilization sciences and arts, in those very ancient times, as to be able to observe accurately the length of the seasonal year, that they must have been observing the equinox at least 1000 years before 3102 B.C., that their arithmetic must have been so much advanced as to enable them to count the days of 1000 years and that their devices of keeping time and measuring parts of the days, must have been so much advanced as to enable them to find out the day on which the day and the night were of equal duration (this being necessary to determine the equinox). Chronology is pregnant with such possibilities of accurate and important historical knowledge.

2. But Ancient Indian Chronology has upto this day baffled the efforts of many an indefatigable student. This was the result of the fact that they did not employ the method namely the astronomical method, that alone could have been fruitful. It is, therefore, proposed here to explain this method and to apply it to the fullest extent possible to the problems of Ancient Indian Chronology.

3. It is proposed to determine the dates of major events, thus enabling the minor events to arrange themselves between them, to discover the starting point and the dimensions of the Cycles (*Yugas*) used by the ancient Indians, which would

serve as a key to unlock the ancient historical works and finally to draw a brief sketch of the Chronology of the History of Ancient India.

4. The astronomical method finds dates from astronomical statements and relies most upon them. It does not, however, exclude other historical evidence. It makes use of the astronomical statements in conjunction with other historical evidence. In fact it requires the help of such historical evidence.

5. It may be said that many have used this astronomical method before and especially that the late Lokamānya Tilak used it in the "*Orion*" for determining the date of the Vedas. It is true that the astronomical method was first used by Mr. Kṛishṇa Śastrī Godbole, of Mahārāshtra, then by Mr. Nārāyaṇa Aiyengār and Prof. Rangāchārya of Madras and afterwards by Doctor Jacobi and Lokamānya Tilak simultaneously but independently of each other and subsequently by the late Mr. Shankar Balkṛishna Dixit also.[1]

6. We are much indebted to these pioneers and especially to the late Lokamānya Tilak and to the late Mr. S. B. Dixit. But they did not develop the method to its perfection and did not employ it to the extent to which it could be employed.

7. Their attempts were mainly directed to finding out the position of the equinox at the time of any event. But as the equinox remains in one constellation for about one thousand years, there could be a mistake of one thousand years in the date that was determined, even if the constellation they found out was quite exact. We shall employ an exact method. We shall make use of the positions of the planets especially the fast-moving planets for determining the exact dates. We shall make use of eclipses to select from of to confirm the dates so determined.

[1] See *The Vedic Chronology and Vedānga-Jyotisha*, by Lokamānya Tilak, Introduction, pp. 14-16.

8. But this is not the only difference between ourselves and our predecessors. We shall make use of the dynasties of kings given in ancient historical works to verify our results and to select one out of the several solutions mathematically obtainable; secondly, we shall try to discover by the astronomical method, the dimensions of the cycles and their starting point used by the ancient Indians in narrating historical events. This is a very important difference, for, the dimensions and the starting points of the cycles being known, we can find only by their help the dates of several events with exactness.

9. An objection may be raised against this method that there are no historical works written by the ancient Indians that would furnish us with proper astronomical and other data. This is not correct. The ancient Indians also found it necessary to write history and there are some works written by the ancient Indians that claim to narrate history. There is the *Vāyu Purāṇa*, the *Brahmāṇḍa Purāṇa*, the *Mahābhārata* including the *Harivanśa* and the *Rāmāyaṇa* that are shown to be histories either by the introduction (*Upakrama*) or by the conclusion (*Upasanhāra*) of those works.

10. The *Vāyu Purāṇa* says in the concluding chapter (Chapter No. 103),

" इमं यो ब्राह्मणो विद्वान् इतिहासं पुरातनं ।
शृणुयाच्छ्रावयेद्वापि तथाऽध्यापयतेऽपि च ॥
स्थानेषु स महेंद्रस्य मोदते शाश्वतीः समाः " ॥ ४९ ॥

" The learned Brahmaṇa who hears or tells or teaches this old history will enjoy happiness for eternity in the abodes of Mahendra "; and

" इतिहासमिमं श्रुत्वा धर्माय विदधे (दधते) मतिम् " ॥ ५६ ॥

" Having heard this history a man sets his heart upon *Dharma* ". The *Brahmāṇḍa Purāṇa* has got virtually the same passages in Chapter IV of the fourth *pada*. This proves that the *Vāyu Purāṇa* and the *Brahmāṇḍa Purāṇa* are histories.

11. Indeed the word *Purāṇa* itself shows that they are histories; for the word "*Purāṇa*" means a "Chronicle" and the *Vāyu Purāṇa* and the *Brahmāṇḍa Purāṇa* have been brought up to date from time to time just like a chronicle. It is, therefore, no derogation as some suppose that they are the works of several authors but rather it is a merit. The *Brahmāṇḍa Purāṇa* and the *Vāyu Purāṇa* are only two editions of a previous work; for both the *Vāyu Purāṇa* and the *Brahmāṇḍa Purāṇa* say

"पुराणं संप्रवक्ष्यामि यदुक्तं मातरिश्वना ॥
पृष्टेन मुनिभिः पूर्वं नैमिषीयैर्महात्मभिः"[2] ॥

"I will tell you the Purāṇa that was formerly told by Vāyu to the sages of the Naimisha forest." There are therefore many passages common to them. But the *Vāyu Purāṇa* is a more faithful and more up-to-date edition of the previous work as a comparison of both clearly shows.

12. The *Mahābhārata* is called a history (*Itihāsa*) in several places in the introductory chapters (*Ādi Parva*, Chapter 1, verses 19–22; 26 and 54; Chapter 62, Verse 20); and the *Harivanśa* and the *Kansavadha* are said to be supplementary parts (*Khila Parva*) of the *Mahābhārata* and are included amongst the hundred Parvas of the *Mahābhārata* (*Ādi Parva*, Chapter 2, verses 82 and 83).

13. The introductory chapter of the *Rāmāyaṇa* shows that it is the life of a King then actually living on earth held up as an ideal for imitation. A short history of the same personage is given in the *Vāyu Purāṇa*, Chapter 88 also, and it does not in any way conflict with the story in the *Rāmāyaṇa*. The *Rāmāyaṇa* also is, therefore, a history.

14. We do not regard the other Purāṇas as historical, for their introductions show that their subject is *Dharma* and not history. The historical Purāṇas are only the two

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[2] *Brahmāṇḍa Purāṇa*, Chapter I, verses 36–37; and *Vāyu Purāṇa*, Chapter I, verses 47–48.

mentioned above; all others are *Dhārmika* Purāṇas. But even in some *Dhārmika* Purāṇas namely the *Bhāgavata Purāṇa*, the *Vishṇu Purāṇa*, and the *Matsya Purāṇa*, we find portions that give the dynasties. The motive for giving these dynasties that correspond with those in the *Vāyu Purāṇa*, cannot be any other than historical and these portions must also be regarded as histories.

15. But some objectors say that these historical works are full of absurdities and discrepancies and cannot be relied upon. This is illogical. No doubt the language of ancient books is hyperbolical and poetical. But the hyperbolical statements cannot vitiate the other statements that can be construed to have a rational meaning and the poetical statements have certainly some rational facts as their basis. For instance, the waiting of Bhīshma for *Uttarāyaṇa* before giving up his life voluntarily, has for its basis the fact, that though he lay wounded for 58 days he died just after the *Uttarāyaṇa* began. Moreover, it is quite possible in works written thousands of years ago, that their language has become unintelligible on account of changes in the meanings of words and such other causes, and that mistakes in the reading of the text and interpolations and deletions have corrupted them. It is thus that there are discrepancies and absurdities in the texts. It is, therefore, our duty to discover changes of meanings of words and such other causes, that make the texts unintelligible, mistakes in reading of texts and interpolations or deletions. It is wrong to regard these historical works as unreliable only on account of hyperbolical or poetical language or discrepancies and absurdities that can be explained by causes suggested above and thus can be removed.

16. Let us take an illustration. There is the following statement in the *Mahābhārata*:—

चंद्रसूर्यावुभौ ग्रस्तौ एकाह्ना हि त्रयोदशीम् ।
अपर्वणि ग्रहेणैतौ प्रजासंक्षयमिच्छतः ॥[3]

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[3] *Bhīshma Parva*, Chapter 3, verse 28

It can be translated as follows:—

"Both the Sun and the Moon were eclipsed on the same day that was the thirteenth *Tithi* (Lunar day)." Thus translated this statement becomes an absurdity; because an eclipse can happen only on the fifteenth *Tithi* and because both the Sun and the Moon cannot be eclipsed on the same day. The objectors say that because this is absurd, all astronomical statements in the *Mahābhārata* are unreliable or that even the whole *Mahābhārata* is unreliable. This is not the correct course. Instead, we ought to interpret the words '*Ekāhnā*' (एकाह्ना) and *Trayodaśīm* (त्रयोदशीं) in such a way that we would get a rational meaning. The former can be interpreted to mean "on the same week day", *i.e.*, "at an interval of fourteen days" and the latter to mean "the thirteenth *Tithi* calculated by the wrong method then known". The statement can thus be translated as follows:— "Both the Sun and the Moon were eclipsed on the same day of the week (*i.e.*, at an interval of 14 days) and on the thirteenth *Tithi* as obtained by calculations, then in vogue." This is a perfectly rational meaning.[4] We ought to interpret statements in works professing to be historical in this manner and not otherwise. Our prejudices should not stand in the way of our accepting such interpretations.

17. While putting so much stress upon the correct interpretation of words, we have also at the same time to condemn the efforts of those who give imaginary and unsupportable meanings to words to remove contradictions. Let us take an illustration. "मघास्वंगारको वक्रः"[5] has a plain meaning and it is that "the retrograde Mars is in the *Maghā*. But some have interpreted it to mean "the Mars in the *Pushya* is afflicting the constellation *Maghā*. This meaning is absolutely incorrect; for, to express such a meaning the *Mahābhārata* uses the verb *Pīḍ* (पीड्) elsewhere. We cannot condemn such efforts too strongly.

[4] See *infra*, paragraphs 43–46.

[5] *Bhīshma Parva*, Chapter 3, verse 14.

18. If correct interpretation does not remove discrepancies and absurdities we ought to resort to other methods, also supported, of course, by valid reasons. Such methods are (1) correction in the reading of the text, (2) discovery of the mistake of the author and (3) supposition of interpolation or deletion.

19. Lokamānya Tilak, for instance, has used the first of these methods in his "Notes on the Interpretation of the *Vedānga-Jyotisha*". For "*Duheyam*"[6] (दुहेयं), in the 12th śloka of the *Yajur-Vedānga-Jyotisha* he has suggested "*Dyu heyam*" (द्यु हेयं), a very ingenious and satisfactory reading that gives a very rational meaning. (See pages 86–93 of the book *The Vedic Chronology and Vedānga-Jyotisha*, published after his death by his sons.) He thus supports this proposition. We should note in this connection, that planetary positions at a possible date can suggest correct interpretation or corrections in the text and that these in their turn can confirm the possible date. We have to resort to such methods to solve problems otherwise insoluble.

20. Thus, when similarity in writing or in pronunciation shows a mistake in the reading of the text to be probable and when the reading in the text is ungrammatical or unnatural or gives an irrational meaning or a meaning inconsistent with other statements or natural course of events or realities, we can infer a mistake in the reading of the text. I have thus inferred the reading *Chaitām* (चैताम्) for *Chitrām* (चित्रां)[7] and an interchange of *Śravaṇe* (श्रवणे) and *Pushyeṇa* (पुष्येण) in the next lecture.[8]

21. We may also infer that mistakes were committed by authors, if we find that they were not the actual observers of facts but made their statements following the statements of those who actually observed or by making inferences from

[6] See *infra*, paragraphs 41 and 42.
[7] See *infra*, para. 130.
[8] See *infra*, paragraphs 221–27.

the statements of others. Statements of such authors are called secondary evidence and are not admissible in evidence at least if they conflict with the primary evidence, *i.e.*, with the statements of those who were the actual observers; for the conflict shows that they made some mistakes in understanding the statements of others or in making inferences from them. For the sake of illustration let us take here the statement,

आसन् मघासु मुनयः शासति पृथिवीं युधिष्ठिरे नृपतौ ।
षड्द्विकपंचद्वियुतः शककालस्तस्य राज्यस्य ॥[9]

This is clearly an inferential statement and has no value as it conflicts with the deductions from astronomical statements; and, therefore, as it stands, it must have been based upon some wrong inference. We ought to find out mistakes of the authors of such statements before we make any use of them. For illustration, I have found out the mistake in,

महापद्माभिषेकात्तु यावज्जन्म परिक्षितः ।
तावद्वर्षसहस्रं तु ज्ञेयं पंचाशदुत्तरम् ॥[10]

and then used it.

22. The supposition of interpolation or deletion must also be supported by some evidence, namely inconsistency or absurdity not otherwise explicable or obscurity of meaning or glaring deficiency or absence of context or context with a word or sentence separated by an interposition, in addition to a motive for the interpolation or deletion. For illustration, we cannot suppose that the verse,

चत्वारिंशद्दिनान्यद्य द्वे च मे निःसृतस्य वै ।
पुष्येण संप्रयातोऽस्मि श्रवणे पुनरागतः ॥[11]

is an interpolation; because we can see no motive for interpolation and also because its seeming inconsistency with other statements can be explained by supposing a mistake in the text.

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[9] See *infra*, para. 184.
[10] See *infra*, paragraphs 163–67.
[11] See *infra*, para. 221.

23. But we have no freedom to resort to any method of removing inconsistencies and absurdities just because it suits us. If correct interpretation serves our purpose we should not resort to other methods mentioned above. If the former of these methods serves our purpose we should not resort to the latter. For we must strictly observe the principle of doing the least violence to the text, and the latter methods do greater violence to the text than the former.

24. Thus far, we have discussed about the methods of removing inconsistencies or absurdities. They show that if they are properly used, we get reliable historical evidence from the works mentioned above.

25. However, it should be noted that for calculating dates by astronomy we shall make use of only those statements, in respect of which, no method except that of correct interpretation has been used and that we shall not use even that statement, the correct interpretation of which, is in doubt. These other methods shall be used only to show that the statements apparently inconsistent with the calculated date can be reconciled with that date or can be properly neglected. Any interpretation though it may be doubtful may however be used for this same purpose.

26. While the historical works mentioned above, furnish data for determining the dates of events and the dimensions and the starting point of the cycles, the Brāhmaṇas furnish very important data for determining the dimension of the year used by the ancient Indians. For, the subject dealt with by the Brāhmaṇas is the *Yajña* (यज्ञ) and the *Yajña* is said to be the year (संवत्सर) also (*Śatapatha Brāhmaṇa* says "संवत्सरो वै यज्ञः प्रजापतिः "........13. 1. 1. 1.). This can only mean that the *Yajñas* were regulated by the year, *i.e.*, by the position of the Sun in the heavens. Thus the *Brāhmaṇas* have indirectly to deal with the motions of the Sun and furnish important data for determining the length of the year of the ancient Indians.[12]

[12] See *Orion*, pp. 11–14.

27. We must here note another peculiarity of our method. We shall not determine the date of a single event in isolation from others. We shall consider the dates of all important events together at one and the same time, for, we must take care that the date of one event does not conflict with those of the others. This can be done by seeing if the interval between the determined dates of events agrees with the generations between those events given by the Purāṇas, or with the natural course of events.

28. Now, we shall study the method of actual calculation. We first ascertain from the astronomical statements the position of any planet at the time of any event. We already know the position of this planet at any particular time or the Zero-date. We can then find the period of time that the planet would take to go from its position on the Zero-date to its position at the time of the event. Suppose this is "*a*" years. It, therefore, follows that the planet will be in its position at the time of that particular event, "*a*" years after the Zero-date. But it will also be in the same position again and again at intervals of any number of its complete revolutions. Therefore, we get the following equation:—

Time of any event $= a +$ (Period of one Revolution of a planet) $\times$ (Any number of its complete Revolutions).

In this equation we have two unknown quantities, the Time and the number of complete Revolutions; but we have got only one equation for two unknowns. Such an equation is called an indeterminate equation and it can be solved but we get a series of answers and we do not know which to accept.

29. If we get two such equations, the unknown Time is eliminated and we get an equation like the following:—

$(a-a')+$ (Period of one Revolution of one Planet) $\times$ (any complete number of Revolutions of the Planet) $=$ (Period of one Revolution of another Planet) $\times$ (any complete number of Revolutions of that another Planet), where a' is the time that that another planet takes to go from its position

on the Zero-date to its position at the time of the event, the date of which is to be found. This is also an indeterminate equation, for, it has also two unknowns, the complete number of revolutions of one planet and the complete number of revolutions of another planet. From this also we get a series of answers; but the interval of time between them is longer than between the answers that we get from the equation of the first kind, *i.e.*, the answers from the equation of the second kind are fewer than those from the equation of the first kind and, therefore, our work of selecting any one from the several answers becomes easier. If we get several equations of the second kind for the date of the same event, we get several series of answers and we get from these series a new series of answers common to all the several series; the answers in this new series being much fewer in number, our work of selection becomes still easier. In this way the answers become fewer and fewer until we arrive at one single answer—the answer we desire.

30. Before concluding this chapter, our data will be enumerated. They are:—(1) dynasties given in the Purāṇas and the other historical works. (2) Statements in the Brāhmaṇas that refer to the dimensions of the year or the Cycles. (3) Planetary positions given in historical works especially those in the *Mahābhārata* in *Bhīshma Parva*, Chapters 2, 3 and 17, in *Udyoga Parva*, Chapter 143, in *Karṇa Parva*, Chapter 94, in *Śalya Parva*, Chapter 11, in *Mausala Parva*, Chapter 2, in *Sabhā Parva*, Chapter 79; statements in the *Harivanśa*, *Parva* 2, Chapter 23, verses 25–31; statements in the *Vāyu Purāṇa*, Chapter 53, relating to the planetary positions at the time of the Chākshusha Manu; statements in the *Rāmāyaṇa* in *Araṇya-Kāṇḍa*, *Ayodhyā-Kāṇḍa* and *Yuddha-Kāṇḍa*. (4) The whole of the *Vāyu Purāṇa* and historical statements in the historical works already mentioned. We can also make use of the *Rājataranginī* by Kalhaṇa Paṇḍita, which is indisputably a historical work. With such good material, we propose to build the edifice of the Ancient Indian Chronology by the method outlined above.

LECTURE II

THE DATE OF THE MAHĀBHĀRATA WAR

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31. The fight over the date of the *Mahābhārata* War is raging as stiff and furious as the *Mahābhārata* War itself. But without winning this fight we cannot capture the citadel of Ancient Indian Chronology. We must, therefore, exert all our efforts to win it. Readers should, therefore, devote their close attention to the inevitably lengthy argument.

32. The question about the date of the War resolves itself into two :—

(1) *First*:—What was the month and the *Tithi* on which the War began ?

(2) *Secondly*:—In what year was the War fought?

33. These two questions are however interdependent. We cannot solve the one without solving the other. We shall, therefore, use the method named " Successive approximation," *i.e.*, we shall first solve the first question approximately, then with the help of this approximate solution we shall solve the second question exactly and with the help of this solution we shall solve the first question again exactly.

34. Before we proceed to the solution of these questions, we must study the elements of the calendar then in vogue; for without knowing these we would not be able to properly understand the statements in the *Mahābhārata*.

35. In the *Mahābhārata* Calendar the ancient Indians took two intercalary months (*Adhika* months) in five years and thus their cycle consisted of five years. This is clear from the following statements:—

अनुसंवत्सरं जाता अपि ते कुरुसत्तमाः ।
पांडुपुत्रा व्यराजंत पंच संवत्सरा इव ॥ २२ ॥[1]

[1] *Adi Parva*, Chapter 124.

तेषां कालातिरेकेण ज्योतिषां च व्यतिक्रमात् ।
पंचमे पंचमे वर्षे द्वौ मासावुपजायतः ॥ ३ ॥[2]

[*Translation.*—" The five sons of Pāṇḍu born in five successive years, appeared (shone) like the five years of the Cycle" (*Ādi Parva*, Chapter 124). "There are two intercalary months in every five years on account of the greater advance of time (of the Solar Months over the Lunar Months) and the increase of the constellations" (*Virāṭa Parva*, Chapter 52).[2]]

If there are two *Adhikas* in five years, it means there are 62 Lunar months in five years, *i.e.*, there are 1860 *Tithis* in five years, *i.e.*, there are 372 *Tithis* in one year. But one year really consists of 371 *Tithis* and 1/16th of a *Tithi*. This shows that the *Mahābhārata* Sun is slower than the real Sun and that the mistake amounts to 1° in each year approximately, 225°/248 exactly. In thirty years the mistakes would amount to 27° approximately and in sixty years to 54°. Such a calendar cannot be in vogue for any length of time. But it

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[1] *Virāṭa Parva*, Chapter 52.

[2] *Note.*—This third verse is followed by the verse

एषामभ्यधिका मासाः पंच च द्वादश क्षपाः ।
त्रयोदशानां वर्षाणां इति मे वर्तते मतिः ॥ ४ ॥

This is said to be inconsistent with the third verse for, at the rate given in the third verse, there ought to be five intercalary months and six *Tithis* more in thirteen years. This inconsistency cannot take away or nullify the import of the third verse—namely that in the days of the *Mahābhārata*, the Indians took two intercalary months in five years; it would at the most prove, that some mistake was made in the calculation and nothing more. However this inconsistency disappears if by *Kshapā* (क्षपा) we understand half a day. In the word *Ahorātra* (अहोरात्र) the word *Ahan* (अहन्) and the word *Rātri* (रात्रि) mean half a day. In the phrase " day and night " both ' day ' and ' night ' mean half a day. Therefore here also *Kshapā* (क्षपा) can mean half a day. And we can take this meaning of *Kshapā* (क्षपा) for removing the inconsistency. In short, this so-called inconsistency does not affect our proposition, that two intercalary months were taken in five years.

is seen to be in vogue at the time of the War. What is the solution of this puzzle?

36. In *Vedānga Jyotisha* also we have the same dimension of the year, *i.e.*, 372 *Tithis*. The examination of the *Vedānga-Jyotisha* is, therefore, likely to reveal to us some solution of the puzzle. Let us, therefore, examine *Vedānga-Jyotisha*, general knowledge of which can be obtained from Mr. S. B. Dixit's "*Bhārateeya Jyotisha*" (भारतीय ज्योतिष).

37. The *Vedānga-Jyotisha*, however, adds to our puzzle. It takes the year to be equal to 366 days and five years to be equal to 1830 days. Thus 62 lunar months are equal to 1830 days. Really they are equal to 1830·8964 days. During twenty years this mistake in the *Tithi* would amount to 3 days and a half approximately. This is too large not to be detected. How did the *Vedānga-Jyotisha* continue in vogue and retain the respect of the people in spite of these two serious mistakes, the mistakes in the Sun and the *Tithi*?

38. The following verse in the *Rig-Vedānga-Jyotisha* solves this puzzle:—

स्वराक्रमेते[4] सोमार्कौ यदा साकं सवासवौ ।
स्यात्तदादियुगं माघस्तपः शुक्लो दिनंत्यजः ॥ ५ ॥

[*Translation.*—"When the Sun and the Moon with the constellation *Dhanishṭhā* (धनिष्ठा—Delphini) will together (साकम्) occupy the sky, then there would be the first *Cycle*, the month of Māgha, the bright half of the lunar month, the season named *Śiśira* (तपः) and the abandonment of days (दिनंत्यजः)."]

39. This shows that at the end of some cycles, (we have already seen that their cycle consisted of five years) when they saw the Sun and the Moon together in the Dhanishṭhā actually

[4] *Note.*—The reading really is स्वराक्रमैके, but as that has no meaning whatsoever, we should adopt the reading स्वराक्रमेते that we get in the corresponding verse of *Yajur-Vedānga-Jyotisha* (यजुर्वेदांगज्योतिष).

in the sky the ancient Indians abandoned some days and thus got the mistakes corrected. This can be at the end of six cycles or seven cycles as the following table will show:—

Cycles	Actual Motion of the Sun	Actual Motion of the Moon
One cycle or 1830 days	5 Revolutions and 3·66447 degrees	66 Revolutions and 352·735744 degrees
Six cycles or 10980 days	30 Revolutions and 21·98682 degrees	401 Revolutions and 316·414464 degrees
Six cycles *minus* 24 days, *i.e.*, 10956 days or 371 lunar months approximately	29 Revolutions and 358·333 degrees or 30 Revolutions approximately	401 Revolutions and 0·1827 degrees or 401 Revolutions approximately

40. This shows that the Sun and the Moon occupy almost the same position again after six cycles *minus* 24 days. This would show that after six cycles the ancients abandoned 24 days and corrected their Calendar. But at times they had to make corresponding correction by omitting 23½ days only after seven cycles as the following table will show:—

Cycles	Actual Motion of the Sun	Actual Motion of the Moon
19 cycles or 34770 days	95 Revolutions *plus* 69·62493 degrees	1272 Revolutions *plus* 221·979136 degrees
19 cycles *minus* 71½ days, *i.e.*, 34698½ days or approximately 1175 lunar months that are really equal to 34698·44 days	95 Revolutions *minus* 0·9 degrees or 95 Revolutions approximately	1270 Revolutions *minus* 0·2 degrees or 1,270 Revolutions approximately

This shows that the ancient Indians had to omit 71½ days in nineteen cycles. But as they omitted 24 days in each of the two former groups of six cycles they had to omit 23½ days in the last group of seven cycles.

41. But until this correction is made, the calculated Sun and *Tithis* would not correspond with the actual Sun and *Tithi* seen in the sky. This mistake in the Sun cannot be

easily seen but that in the *Tithi* can be seen very easily even before the completion of six cycles. Correction in *Tithis* was, therefore, necessary while the cycles were progressing. The *Yajur-Vedānga-Jyotisha* therefore intercalated one day in one cycle and made it equal to 1831 days. This is proved by the 12th verse of the same. The first Pāda of that verse reads "दुहेयं पर्वचेत्पादे" and is quite unintelligible. Lokamānya Tilak has suggested the reading "द्यु हेयं".[5] This does the least violence to the present text and gives an intelligible meaning namely "A day is to be passed over", *i.e.*, intercalated if the Parva is at the end of the Pāda, *i.e.*, if the Pourṇimā or Amāvāsyā occurs when the constellation is ¼th. This happens only once in one cycle, that is, at the end of the 93rd Parva (Pourṇimā or Amāvāsyā)[6] (See *The Vedic Chronology and Vedānga-Jyotisha* by Lokamānya Tilak, pages 86–94.)

42. We get ¼th constellation at the end of a Parva only once in one cycle. Therefore, by this rule only one day is passed over or intercalated in one cycle. If instead of taking 1830 days in one cycle we take 1831 days, that is, one day more, at the time of correction at the end of six or seven cycles, we will have to abandon 30 days or 30½ days instead of 24 or 23½ days or for the sake of convenience one lunar month; for, 95 years are almost exactly equal to 1175 lunar months as shown by the table just given. This appears to be the origin of the *Māsakshaya* (मासक्षय) or loss of month referred to in the line,

क्षयं संवत्सराणां च मासानां च क्षयं तथा ॥ ४६ ॥[7]

43. In the *Mahābhārata* too, there is very clear evidence to show that the number of days of the cycle taken by the

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[5] See *supra*, para. 19.

[6] *Note.*—In 62 Lunar months there are 124 Parvas and the Sun goes 27 × 5 constellations during 124 Parvas. Therefore, in 93 Parvas it goes 101 [illegible] or 101¼ constellations.

[7] *Śānti Parva*, Chapter 301

ancient Indians exceeded 1830·8964 days, *i.e.*, exceeded the actual dimension of 62 lunar months. We have in *Bhīshma Parva*, Chapter 3,

चंद्रादित्यावुभौ ग्रस्तौ एकाह्ना हि त्रयोदशीं ।
अपर्वणि ग्रहेणैतौ प्रजासंक्षयमिच्छतः ॥ २८ ॥

चतुर्दशीं पंचदशीं भूतपूर्वां तु षोडशीं ।
इमां तु नाभिजानेऽहं अमावास्यां त्रयोदशीं ॥ ३२ ॥

चंद्रसूर्यावुभौग्रस्तौ एकमासीं त्रयोदशीम् ।
अपर्वणि ग्रहेणैतौ प्रजाः संक्षपयिष्यतः ॥ ३३ ॥

[*Translation.*—"Both the Sun and the Moon became eclipsed on the 13th *Tithi* on the same day of the week, *i.e.*, at an interval of 14 days. Having become eclipsed on a day other than that of Pournimā or Amāvāsyā, they desire the destruction of the populace. I have seen Amāvāsyā on the 14th, 15th, or the 16th *Tithi*, but never like this on the 13th *Tithi*. Both the Sun and the Moon were eclipsed on the 13th *Tithi* in the same month. Being eclipsed on a day other than Amāvāsyā or Pournimā, they will destroy the populace."]

44. Here the word "*Ekāhnā*" has been taken to mean "On the same day of the week." This interpretation of the word "*Ekāhnā*" (एकाह्ना)[8] will be strenuously objected to. But there are good reasons for this interpretation. Week-days are given in the verse,

"आदित्यः सोमो भौमश्च तथा बुधबृहस्पती ।
भार्गवः शनैश्चरश्चैव एते सप्त दिनाधिपाः ॥ ९३ ॥"

in the *Atharva Jyotisha* which may be as old as the *Vedānga-Jyotisha*, and a week-day is referred to in the *Rāmāyaṇa*[9] as we shall see later on. We should, therefore, accept this interpretation of "*Ekāhnā*" in spite of the prejudices of European Scholars, who say that week-days were unknown to the

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[8] See *supra*, para. 16.

[9] See *infra*, para. 306.

ancient Indians, especially as no other rational interpretation has been put forth. Moreover, this interpretation is justified by the actual calculations that give eclipses on the same week-day. If the Chaldeans knew week-days 3800 years before Christ as European Scholars say, the Indians also could have known them in very early times; for, they could even have borrowed them from the Chaldeans. (See Dixit's *Bhāratīya Jyotisha*, page 138.)

45. The idea of the late Mr. S. B. Dixit was, that at the time of the Mahābhārata War, the ancient Indians knew though incorrectly how to calculate the true positions of the Sun and the Moon, that according to their calculation they got the *Paksha* (the bright or the dark half of the lunar month) to be of 13 days only, and that they saw the eclipse also at the end of the *Paksha*, and that, therefore, it is said there in the *Mahābhārata* that the Sun and the Moon were eclipsed on the 13th *Tithi*. But this is wrong. For, if one *Paksha* is of 13 days, the next must be of 16 days, the two together can never be less than 29 days even by calculation based upon true positions of the Sun and the Moon. Therefore, if one eclipse happened on the 13th day, the next eclipse occurring in the same month must happen on the 16th day. But the *Mahābhārata* says the eclipses of both the Sun and the Moon in the same month occurred on the 13th *Tithi*. Thus Dixit's idea does not explain all the statements.

46. The only acceptable explanation is, that the real *Tithi* was always in advance of, *i.e.*, preceded, the calculated *Tithi*, on account of the excessive length of the lunar month then taken for calculation. The real length of 62 lunar months is 1830·8964 days. But if a period larger than this, *i.e.*, 1831 days as in the *Yajur-Vedānga-Jyotisha* or 1830·9375 days as in the *Pitāmaha Siddhānta* (see my *Bhāratīya Jyotisha Śāstra Nirīkshana*, page 75) be taken as the length of 62 lunar months, every calculated *Tithi*[10] would come later than

[10] *Note.*—By "Calculated *Tithi*" I mean *Tithi* calculated according to the calendar then in vogue.

the actual *Tithi.* The interval between the calculated and the actual *Tithi* would increase as the *Cycles* advance and the statements given above show that it had accumulated to the extent of about two *Tithis* at the time of the War. Therefore, the statement says that both the eclipses, that always happen on the 15th *Tithi* happened on the 13th *Tithi* in the same month. Thus this clearly shows that the length of 62 lunar months taken in the *Mahābhārata* is longer than 1830·8964 days.

47. The following statements also support this explanation :

त्रयोदश्याममावास्यां तां दृष्ट्वा प्राब्रवीदिदं ।
चतुर्दशी पंचदशी कृतेयं राहुणा पुनः ॥ १८ ॥
प्राप्ते वै भारते युद्धे प्राप्ता चाद्य क्षयाय नः ॥ १९ ॥[11]

[*Translation.*—Having seen that Amāvāsyā on the 13th *Tithi*, he (Śree Kṛishṇa) said " Rāhu has again made this 14th *Tithi* the 15th *Tithi.* It had come at the time of the Mahābhārata War and it has come again for our destruction."]

48. This shows that both at the time of the Mahābhārata War and at the time of the destruction of the Yādavas, the 14th *Tithi*, coming on a day on which at the sunrise there was the 13th *Tithi*, was made the 15th by the Rāhu, *i.e.*, by the eclipse and not by any mathematical calculation as suggested by Dixit. We should feel confident, that had Dixit been living he would have accepted this explanation.

49. On the whole, it is clear that in the time of the Mahābhārata War the length of 62 lunar months was taken to be greater than 1830·8964 days. The ancient Indians must, therefore, have been required to abandon a whole lunar month instead of 24 or 22½ days at the end of six or seven cycles and therefore we find the mention of *Māsakshaya* (मासक्षय) " loss of month " in the statement in *Śānti Parva* given above.

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[11] *Mausala Parva*, Chapter 2.

50. We can thus hold the following characteristics of the *Mahābhārata* Calendar to have been proved.

(1) Their cycle consisted of five years of 62 lunar months.

(2) The length of 62 lunar months was greater than their real length, *i.e.*, greater than 1830·8964 days.

(3) At the end of six or seven cycles, one of the 62 lunar months of the cycle was abandoned for correcting the calendar. At this time they made no correction in the *Tithi*. For, otherwise, the mistake in the *Tithi* could not have accumulated to two *Tithis*.

(4) Therefore, the mistake in the calculated Sun could be as great as 30° but could never exceed 30° for the mistake was corrected when the lunar month was abandoned at the end of six or seven cycles.

(5) The calculated *Tithi* came later than the actual. At about the time of the War, the interval between the calculated and the actual *Tithi* was about two *Tithis*.

51. Having thus solved the puzzles about the *Mahabhārata* Calendar and ascertained its characteristics we will proceed to solve approximately the first question, *i.e.*, the question about the month and the *Tithi* on which the War began.

52. In *Udyoga Parva*, Chapter 83, we have the following statement:

कौमुदेमासि रेवत्यां शरदंते हिमागमे ॥ ७ ॥

[*Translation.*—"Sree Kṛishṇa started to go to Hastināpura from Virātapura for making peace between the Pāṇḍavas and the Kauravas, on the constellation Revatī in the month named 'Kaumuda' (कौमुद) at the end of Śarat and the beginning of Hemanta."]

53. The words "कौमुद मास" have been taken to mean the Kārtika by Nīlakaṇṭha, the commentator, but others may dispute it. This verse does not give us any undisputed

data. It only shows that Śree Kṛishṇa went to Hastināpura for making peace at the end of the rainy season, the exact month being unknown. Śree Kṛishṇa stayed at Hastināpura for some days and when returning from that city, he spoke to Karṇa in the following words:—

सप्तमाच्चापि दिवसादमावास्या भविष्यति ।
संग्रामो युज्यतां तस्यां तामाहुः शक्रदेवतां ॥ १८ ॥[12]

[*Translation.*—"There would be Amāvāsyā after the seventh day, *i.e.*, on the eighth day from this day. Let us fight on that day; for it is said that the Lord of that day is Indra."]

54. This statement clearly shows that the fight began on an Amāvāsyā. But this is rejected by others on several grounds. They advance the propositions that the fight began on the 11th *Tithi* of the next bright *Paksha* or on the 14th *Tithi* of the same, when the Moon was in the constellation of the Mṛiga or on the 2nd *Tithi* of the dark *Paksha* coming after this Amāvāsyā. Though the actual *Tithi* and even month is thus in dispute it cannot be disputed that the Lord of that Amāvāsyā on which or a few days after which the War was fought, was Indra. Now, according to the traditional lore, Indra is not the Lord of any *Tithi* whatsoever and in any case not of an Amāvāsyā. (See *Muhūrta Chintāmaṇi*,

तिथीशा वह्निकौ गौरी गणेशोऽहिर्गुहो रविः ।
शिवोदुर्गान्तको विश्वे हरिः कामः शिवः शशी ॥ २ ॥

[*Translation.*—"The Lords of *Tithis* are Fire, Brahmā, Pārvatī, Gaṇeśa, Serpent, Kārtikeya, the Sun, Mahādeva, Durgā, Yama, Viśvedevas, Hari, the Lord of Love, Mahādeva and the Moon. On the other hand, he is the Lord only of the constellation named the Jyeshṭhā." We have therefore to conclude that "शक्रदेवताम्" can only mean that the

[12] *Udyoga Parva*, Chapter 143.

constellation of that particular Amāvāsyā was the Jyeshṭhā.[18] (For the Lords of the constellations see Dixit's *Bhāratīya Jyothisha*, pages 82-83.)

55. So Jyeshṭhā was the constellation of that Amāvāsyā, the first Amāvāsyā that followed the talk between Karṇa and Śree Kṛishṇa. The constellation of the previous Paurṇimā must, therefore, be the Kṛittikā. Let us therefore, hereafter call the month ending in this Amāvāsyā, the Kārtika.

56. We thus get the undisputed fact that the Sun was in the Jyeshṭhā on that particular Amāvāsyā whatever be the name of the month in which this talk between Karṇa and Śree Kṛishṇa took place. The longitude of the star Jyeshṭhā is 229·15°, supposing that of the Zeta Piscium to be 359·33°. (All longitudes given here are measured in this way.) So

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[18] *Note.*—This conclusion appears to be inconsistent with the statement

"न कुर्वंति वचो मह्यं कुरवः कालनोदिताः ।
निर्गच्छध्वम् पांडवेयाः पुष्येण सहिता मया" ॥ १० ॥

in *Śalya Parva*, Chapter 35, addressed by Śree Kṛishna to the Pāṇḍavas after his return from Hastināpura and apparently implying that Śree Kṛishṇa returned from Hastināpura on or before the Pushya constellation; for if the Pushya constellation comes on or after the talk between Karṇa and Śree Kṛishṇa, the constellation on the Amāvāsyā that was to come on the 8th day from the talk, would be the Swāti at the most. This is inconsistent with the inference that the constellation of that Amāvāsyā was the Jyeshṭhā. This inconsistency however, disappears if we construe this verse as follows:—

"The Kauravas do not abide by my advice being impelled by Destiny. Therefore start from Kurukshetra with me as your Pushya constellation." The propriety of this construction is brought home to one's mind if one notes that as ordered by Duryodhana according to the verse

"आज्ञापयच्च राज्ञस्तान् पार्थिवान्हृष्टचेतसः ।
प्रयाध्वं वै कुरुक्षेत्रं पुष्योद्येति पुनः पुनः ॥ २ ॥"

(see *infra*, para. 226), the armies of the Kauravas must have started for the Kurukshetra on the constellation Pushya which was supposed to be the most auspicious and that the Pāṇḍavas could not do the same and that, therefore, Śree Kṛishṇa being confident of his ability to render effective help and advice to the Pāṇḍavas who also had faith in him, could have said such a thing, to the Pāṇḍavas to reassure them that it would not matter even if they could not start on the auspicious Pushya constellation.

the minimum longitude of the Sun on that Amāvāsyā was 216° and maximum 242°. So at the beginning of the War the minimum longitude of the Sun was 216°; supposing of course that War began on that Amāvāsyā. And on the assumption that the War began 17 days after that Amāvāsyā, as some say, the maximum longitude of the Sun, at the beginning of the War would be 259°. But as there could be a mistake of even 30° and not more, we will take it that the maximum longitude of the Sun at the beginning of the War was 289°; therefore the longitude of the Sun at the beginning of the War was 216° *plus* 289° divided by 2, *i.e.*, 252½° approximately.

57. This is the approximate solution of the 1st question; for it indirectly shows the *Tithi* and the Month of the beginning of the War. In actual calculation we shall take the approximate Sun to be 245°. That will not cause any mistake in the exact year.

58. We shall now take up the question of the exact year of the War. But for finding the exact year from the planetary positions and to get only one solution we must know the year also approximately. We shall therefore first consider the approximate year of the War.

59. All the four Purāṇas that give dynasties of Kings, namely the *Bhāgavata*, the *Vishṇu*, the *Vāyu* and the *Matsya*, are agreed that 37 Kings ruled between the Mahābhārata War and the Nandas and that the Nandas ruled for 100 years and then Chandragupta Mourya became the ruler. The date of Chandragupta has been ascertained to be 322 B.C. (More correctly it is 312 B.C. But this difference of ten years not being important for the present purpose we shall not discuss it here.) If one generation be held to be equal to twenty years, this gives us the approximate date of the Mahābhārata War to be 322 *plus* 100 *plus* 20 × 37, *i.e.*, 1162 B.C. Some research-workers say that many Kings have been omitted in the Pourāṇic Dynasties. Even if that be true, the date that we thus obtain from the dynasties, would be

the latest possible date. And the earliest date assigned to the War is 3102 B.C. the beginning of the Kali Yuga according to the astronomical Siddhāntas. We shall therefore take it as proved that the date of the Mahābhārata War is between 1162 B.C. and 3102 B.C.

60. There is another way of finding the approximate date of the Mahābhārata War. It is stated in the *Rāmāyaṇa* that rains then began in Śrāvaṇa, in Southern India, of course. (See *Kishkindhā-Kāṇḍa*, Sarga 26, verses 13–16; these[14] have been given hereafter in Lecture III and translated.) At present rains begin in Southern India about the 7th June. The 7th June corresponded to Vaiśākha Amāvāsyā in 1851 Śaka, to Jyeshṭha Śuddha 11th in 1852 and to Jyeshṭha Vadya 7th in 1853, *i.e.*, to 0th and 11th and 22nd *Tithis* of Jyeshṭha, and therefore to the 11th of the Jyeshṭha on the average. From the 11th of the Jyeshṭha to the beginning of Śrāvaṇa we have 49 *Tithis* or days. The seasons take 72 years to recede one day. Therefore, the approximate date of Śree Rāma is 49 × 72 years before 1852 Śaka, *i.e.*, 1676 years before Śaka Era, *i.e.*, 1600 years B.C. The duration between Śree Rāma and the Pāṇḍavas, is about 400 years corresponding to 22 generations between them as shown hereafter in Lecture IV.[15] The approximate date of the Mahābhārata War is, therefore, 1200 B.C. This agrees with what we have seen before.

61. We shall now ascertain the positions of the planets at the time of the War. Chapters II and III of the *Bhīshma Parva* purport to give the positions of the planets in the morning of the first day of the War; for, after giving these positions Vyāsa says, "You will get the fruit of your unjust acts to-day when the night dawns into day".

(अद्य चैव निशां व्युष्टामनयं समवाप्स्यथ ॥ १५ ॥
Chapter 3, *Bhīshma Parva*)

Now, here, we are beset with difficulties. Two positions are assigned for every planet except the Mercury. The verses

[14] See *infra*, para. 315.
[15] See *infra*, para. 368.

giving these positions, however, obviously fall into two groups, each consistent with itself. Either of the two dates, calculated from each of the two groups, must correspond to the real date of the War. We shall, therefore, study these two groups and find the probable dates from each and select from them, one, with the help of other data.

The First Group

62. 1. मघाविषयगः सोमस्तद्दिनं प्रत्यपद्यत ।
दीप्यमानाश्च संपेतुर्दिवि सप्त महाग्रहाः ॥ २ ॥[16]

[*Translation.*—" On that day (on which all the Kings came together) the Moon was in the constellation whose subject is the same as that of the Maghā, *i.e.*, in the constellation named the Mūla; and all the seven large planets, being effulgent met together in the Sky."]

63. The Śloka just previous to this shows that, that was the day on which all Kings (planets, according to the Madras Edition) had met together. It was not, therefore, the day on which the War began. The 7th and 12th verses where it is stated that they (kings) after being brought together and addressed by Bhīshma, started with their armies, of course, to go to the battle-field, also, show the same.

64. The seven large effulgent planets are: The Sun, the Moon, the Mercury, the Venus, the Mars, the Jupiter and the Saturn. That they met together in the Sky does not mean that their longitudes were the same. For they being effulgent, *i.e.*, bright enough to be seen by the naked eye they must be at some distances from the Sun. Their meeting together, therefore, means only that they were near each other. It does not preclude their being in different constellations. If an observer can see all of them at once except the Sun just before sunrise, when facing towards the East, he would feel that all the seven planets met together. This verse expresses the feeling of that observer. The first line of the verse has

[16] *Bhishma Parva*, Chapter 17.

been so construed as to agree with this meaning of the second line. In the *Atharva Jyotisha* the twenty-seven constellations have been divided into three groups of nine each, every tenth constellation having the same subject (विषय) under its influence (see *Dixit*, pages 99–100). Therefore, the subject under the influence of the Maghā, the Mūla and the Ashwinī is the same. Therefore, the first line of the verse can be construed to mean either that the Moon was in the Mūla or in the Ashwinī. But if we take the latter meaning the Moon stands far distant from the Sun, which we have already seen to be near about the Jyeshṭhā, and that would be inconsistent with the second line as explained above. We should therefore accept the former meaning, *i.e.*, that the Moon was in the Mūla.

65. The statement in this verse is the chief statement in the first group. All other statements in the *Mahābhārata* that are consistent with this verse are included in the first group and all those that are inconsistent with this verse are included in the second group.

66. 2. संवत्सरस्थायिनौ च ग्रहौ प्रज्वालितावुभौ ।
विशाखायाः समीपस्थौ बृहस्पतिशनैश्चरौ ॥ २७ ॥[17]

[*Translation.*—" Both the Jupiter and the Saturn, the planets that stay for a year or years (in one Rāśi or constellation), being effulgent stand near the Viśākhā."]

67. This is quite clear and falls under the first group. The longitude of the Viśākhā is approximately 209°. The longitudes of the Jupiter and the Saturn have therefore been taken to be 211° for the purposes of calculation.

68. 3. वक्रानुवक्रं कृत्वा च श्रवणं पावकप्रभः ।
ब्रह्मराशिं समावृत्य लोहितांगो व्यवस्थितः ॥ १८ ॥[18]

[*Translation.*—"The planet Mars that is as bright as fire, having moved retrograde towards the constellation Śravaṇa

[17] *Bhīshma Parva*, Chapter 3.
[18] *Ibid.*, Chapter 3.

once and once again (*i.e.*, twice) has returned to and occupied the sign or constellation of the Brahman, *i.e.*, the Jupiter; the reading in Madras Edition is 'प्राप्य नक्षत्रमाश्रित्य' in the third Pāda but that does not change the meaning. 'श्रवणं' is in the accusative on account of the preposition 'प्रति' to be understood."]

69. The word "वक्रानुवक्रं" literally means retrogression and retrogression following it, *i.e.*, retrogression on two occasions. Some may doubt this meaning. However, whatever the meaning, the position of the Mars at the time of the War is quite clear and it is near the Brahman. Now the Jupiter is the only Brahman amongst the planets. Therefore the Mars is near the Jupiter, *i.e.*, 211° approximately. It may be objected that the Jupiter being the lord of the Pushya constellation, Brahma-Rāśi can mean also the Pushya. But the Mars in the Pushya does not fall in the first group and it is inconsistent with the second group also where the Mars is said to be in the Maghā. Therefore, this meaning is to be rejected, especially as the statement in 4 given in paragraph 70 also shows that the Mars was near the Mercury and the Venus, *i.e.*, near the Sun.

70. 4. भृगुसूनुधरापुत्रौ शशिजेन समन्वितौ ।
चरमं पांडुपुत्राणां पुरस्तात्सर्वभूभुजां ॥ १७ ॥[19]

[*Translation.*—"The planets, the Mars, the Venus and the Mercury, were in front of (to the East of) the eldest of the sons of Pāṇḍu, who were the masters of the whole Land (or of the land of the Kurus)."]

71. For *Sarva* "सर्व" in the last Pāda of the verse, there is another reading also, *i.e.*, "कुरु". The word "चरमं" literally means the last; the eldest is the last if we count from the youngest; therefore "चरमं" has been taken to mean the eldest to suit the context. The verse is part of the description of the fight between Yudhishthira and Śalya

[19] *Śalya Parva*, Chapter 11 (omitted in the Madras Edition).

on the morning of the 18th day of the War. The planets, the Venus and the Mercury, can, therefore, be seen only in the East. In the fight the Pāṇḍavas faced the East and the Kauravas faced the West.

(" पश्चान्मुखाः कुरवो धार्तराष्ट्राः स्थिताः पार्थाः प्राङ्मुखा योत्स्यमानाः ॥ ५ ॥")[20]
Therefore, the planets, the Venus, the Mercury and the Mars, that was near them were all in front of or to the East of the Pāṇḍavas and this is clearly expressed by the word " पुरस्तात् ". The word " चरमं " is in the accusative because of the preposition " प्रति " that is to be understood.

72. 5. हते कर्णे सरितो न प्रसस्रुः ।
जगाम चास्तं सविता दिवाकरः ॥
श्वेतोग्रहश्च ज्वलनार्कवर्णः ।
सोमस्य पुत्रोऽभ्युदियाय तिर्यक् ॥ ४९ ॥[21]

[*Translation.*—"After Karṇa was killed the rivers ceased to flow (being frozen on account of winter season), the Sun set, the white planet Venus became as bright as fire or the Sun and the planet Mercury, the son of the Moon, arose concealed (invisibly).]

73. I have given above the Madras reading of the 3rd Pāda of the verse. The Bombay reading of this Pāda is " ग्रहश्च तिर्यक् ज्वलनार्कवर्णः ". The translation of the Bombay reading would be:—

" After Karṇa was killed, the rivers ceased to flow (being frozen on account of the winter season), the retrograde planet became as bright as fire or the Sun and the planet Mercury, the son of the Moon. arose concealed (invisibly)."

The retrograde planet mentioned here must be the Venus; for, that only can be very bright and retrograde when near the Sun, as it necessarily must be according to the statement in " दीप्यमानाश्च संपेतुर्दिवि सप्तमहाग्रहाः " discussed in *supra*, paragraph 64.

[20] *Bhishma Parva*, Chapter 20.
[21] *Karṇa Parva*, Chapter 94.

74. The word "तिर्यक्" has not been properly understood by others. The word "तिरस्" from which it is formed has two meanings, *i.e.*, (1) obliquely, crookedly; (2) secretly, invisibly, covertly. The word "तिर्यक्" can therefore mean both (1) retrograde and (2) invisibly. We should take either of these meanings where it suits.

75. It should be noted that the Mercury does not *become* retrograde *after* it has begun to appear in the East. It *becomes* retrograde only while appearing in the West, and continues its retrogradation for some time after it has begun to appear in the East. Therefore, we cannot understand the last Pāda of the verse to mean that the Mercury *became* retrograde after Karṇa's death. Nor can we understand it to mean only that it arose being already retrograde from before Karṇa's death; for the author clearly intends to mention things that happened after Karṇa's death and the rising of the retrograde Mercury would, in that case, be an event happening every day. The setting of the Sun is also an event happening every day but it can be mentioned if the Sun set just after Karṇa's death, especially because the Sun was regarded as Karṇa's father. We have, therefore, to understand this last Pāda of the verse to mean that the Mercury became invisible after Karṇa's death. The poet may have used the word "तिर्यक्" in both the Pādas of the verse to show its double meaning and thus to ornament the verse. In the fourth Pāda of the verse the reading in the Madras Edition is "यमस्य पुत्रोऽभ्युदियाय तिर्यक्". This reading is clearly mistaken for amongst the seven planets there is none who is the son of Yama.

76. 6. बृहस्पतिः संपरिवार्य रोहिणीम् ।
बभूव चंद्रार्कसमो विशांपते ॥ ५१ ॥[33]

[*Translation.*—" (When Karṇa was killed) the Jupiter, having made the Rohiṇī to conceal herself, became like the Sun or the Moon."

[33] *Karṇa Parva*, Chapter 94.

Explanation.—The root in 'संवरितार्थं' means to conceal. Its causal form therefore means "to make to conceal". The Jupiter being in the Viśākhā (see *supra*, para 66) the distance between the Jupiter and the Rohiṇī was twelve constellations, *i.e.*, nearly 160°, at the time of Karṇa's death. Therefore when the Jupiter rose the Rohiṇī went down to the horizon and became invisible. This is just like the Rohiṇī's becoming invisible on account of the Sun or the Moon approaching the Rohiṇī and therefore it is said that the Jupiter became like the Sun or the Moon.

77. There are some other statements coming under the first group but we need not refer to them at this stage. These six statements are sufficient for finding the date of the War.

THE SECOND GROUP

78. We now come to the second group. It consists of two verses only. They are these :—

मघास्वंगारको वक्रः श्रवणे च बृहस्पतिः ।
भगं नक्षत्रमाक्रम्य सूर्यपुत्रेण पीड्यते ॥ १४ ॥
शुक्रः प्रोष्ठपदे पूर्वे समारुह्य विरोचते ।
उत्तरे तु परिक्रम्य सहितः समुदीक्षते ॥ १५ ॥[23]

[*Translation.*—"The Mars is retrograde in the Maghā and the Jupiter in the Śravaṇa. The Saturn is afflicting the Pūrvā Phalgunī. The Venus, riding on the *Pūrva Proshṭhapada* (*Pūrvābhādrapadā*) literally the back of the bullock, appears beautiful and having gone round to the North and having become stationary it is waiting (for the Sun coming from behind)."]

This does not give any position for the Saturn; for, a planet can afflict another constellation while standing in one. It should be noted that when near the stationary point a planet goes round to the North or to the South and this fact is expressed by the fit word "परि" in "परिक्रम्य". The

[23] *Bhīshma Parva*, Chapter 3.

word " सहितः " means stationary for the root " सह् " means to stop, to wait, as in " द्विश्राण्यहान्यर्हसि सोढुमर्हन् ".[24]

79. The second group consists of these two verses only found in *Bhīshma Parva*, Chapter 3. All statements found elsewhere fall in the first group.

80. We have first to find the probable dates of the War from each of these two groups and then to select from them. How to select? There is one test that will help us in this selection. It is the test of the eclipses. We have seen that two eclipses, one of the Sun and the other of the Moon took place in the same month. That this statement about eclipses indicates the year of the War is quite certain; for the statement is connected with dark forebodings, *i.e.*, " अपर्वणि ग्रहेणैतौ प्रजाः संक्षपयिष्यतः " Those statements that are connected with dark forebodings must indicate the year of the War. That these eclipses took place in the Kārtika is known from what follows.

81. It is clear that the talk between Karṇa and Śree Kṛishṇa referred to in *supra*, paragraph 53, took place in the dark half of the Kārtika. In the same talk we have,

सोमस्य लक्ष्म व्यावृत्तं राहुरर्कमुपैति च ॥ ११ ॥[25]

This means that the spot, *i.e.*, the eclipse of the Moon has already happened and the Rāhu is approaching the Sun. This shows that the eclipse of the Moon took place on the Pourṇimā of the Kārtika and that an eclipse of the Sun was expected on the next Amāvāsyā. A solar eclipse sometimes happens on the Amāvāsyā next before or after a lunar eclipse; this simple law must have been known to the ancient Indians. Therefore, the surmise of a solar eclipse on the Amāvāsyā of the Kārtika must have been made from a lunar eclipse on the Pourṇimā of the Kārtika and the words " सोमस्य लक्ष्म व्यावृत्तं " also mean that a lunar eclipse took place. Therefore, the

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[24] *Raghuvamśa*, Chapter V.

[25] *Udyoga Parva*, Chapter [illegible].

verse must be taken to mean that a lunar eclipse took place on the Pournimā of the Kārtika. Having therefore found the probable years from each group we shall apply the test of eclipses in Kārtika for making the selection.

82. Now we shall find the dates from the first or the second group. The positions of mean planets on Sunday the 9th *Tithi* of the Chaitra Vadya in Śaka 421[26] are given in Mr. S. B. Dixit's book the *Bharateeya Jyotisha* to be as follows :—[27]

Planet	Mean Longitudes			
	Signs	Degrees	′	″
Sun	0	0	0	0
Moon	9	10	48	0
Rāhu	11	22	12	0
Moon's Aphelion	1	5	42	0
Mars	0	7	5	0
Jupiter	6	7	29	54
Saturn	1	18	20	6
Mercury	6	3	22	12
Venus	11	26	17	36

The time is 15 Ghaṭīs after mean Sunrise at Ujjayini. The longitudes are measured from a point 40′ to the East of the Zeta Piscium.

83. In the following calculations this date and time is regarded as 0 (Zero), the time being *plus* or *minus* after or before this date. Here I have taken the longitudes of the Moon, the Rāhu and the Moon's Aphelion from Ādya Sūyra Siddhānta. This is necessary to ensure accuracy in the

[26] This is the current year; the past years are 420.
[27] See p. 200, columns 12, 1 and 3.

calculation of ancient eclipses especially the total solar eclipse referred to in the *Harivanśa*; because, for this we must have their positions actually observed, at a time as much distant from our time as possible and their motions derived by comparison of those positions with those of the present times. We should therefore use the Bhagaṇas, *i.e.*, their revolutions in 4320000 years derived in this way. They are as follows:—

Moon	..	57752979·67	These are the Bhagaṇas on the Zero-date.
Rāhu	..	minus 232273·4	
Moon's Aphelion		488160·5	

84. The positions and revolutions of other planets are taken as they are in European Astronomy, for our ancient astronomers did not understand perfectly how to find them. Their revolutions are:—

Mars ..	..	2296874·0
Jupiter ..	..	364194·0
Saturn ..	..	146655·0
Mercury	..	17937038·0
Venus ..	..	7022259·5

Days of 4320000 years are 1577907540·0.

The time corrections are to be taken as given in my *Karaṇa-Kalpalatā*, *i.e.*, equal to $+\frac{C^2}{55}$, $+\frac{C^2}{6}$, $+\frac{C^2}{8}$, $-\frac{5C^2}{8}$, minutes for the Sun, the Moon, the Rāhu and the Moon's Aphelion respectively, where C are the centuries from the Zero-date.

85. The date of the Pāṇḍavas is taken to be minns 1,700 for at present we only require an approximate date for calculating longitudes of the apsides, etc. The longitudes of the apsides in minus 1700 are taken to be as follows :—

Aphelion of	Longitude of the Aphelion	
	Signs	Degrees
Sun	2	12
Jupiter	5	18
Venus	9	23
Mars	4	0
Mercury	7	21
Saturn	7	26

86. Now we calculate the date from the first group. We take it that, the longitude of the

True Sun is .. 245°
,, Jupiter is .. 211°
,, Saturn is .. 211°
,, Mars is .. 211°

The mean positions calculated from these are approximately as follows :—

Sun's longitude .. .. 245°
Jupiter's longitude .. .. 208°·43
Saturn's longitude .. .. 204°·70
Mar's longitude .. .. 199°·75

Now the longitude of the Jupiter is 187°·5 on the Zero-date; it would take 0·69 years to become 208°·43. The longitude of the Saturn is 48°·3, on the Zero-date; it will take 12·73 years to become 204°·70. Therefore, we get the following equation:—

$$12 \cdot 73 + 29 \cdot 456624 \times \text{(Full Revolutions of the Saturn)} = T \text{ (the time of the War)}$$

and

$$0 \cdot 69 + 11 \cdot 861764 \times \text{(Full Revolutions of the Jupiter)} = T.$$

Combining these two equations we get:—

$$\frac{12\cdot04 + 29\cdot456624 \times \text{(Full Revolutions of the Saturn)}}{11\cdot861764}$$

= Full Revolutions of the Jupiter.

Or approximately,

$$\frac{61 + 149 \times \text{Full Revolutions of the Saturn}}{60}$$

= Full Revolutions of the Jupiter.

This is an indeterminate equation (कुट्टक) and its solutions are :—

(1)	Revolutions of the Saturn ..	= minus 29
	Revolutions of the Jupiter ..	= minus 71
	T ..	= minus 841·49 years
(2)	Revolutions of the Saturn ..	= minus 89
	Revolutions of the Jupiter ..	= minus 220
	T ..	= minus 2608·89 years
(3)	Revolutions of the Saturn ..	= minus 149
	Revolutions of the Jupiter ..	= minus 369
	T ..	= minus 4376·30 years

But we know that the Sun, the Jupiter and the Saturn come approximately to the same position again after 59·30 years or 913·35 years; for, five revolutions of the Jupiter require 59·308820 years and two revolutions of the Saturn require 58·913248 years and 77 revolutions of the Jupiter require 913·3558 years and 31 revolutions of the Saturn require 913·1553 years. Therefore the years we get are:—

(1)	Minus 722·89	(13)	Minus 1932·74
(2)	„ 782·19	(14)	„ 2549·59
(3)	841·49	(15)	„ 2608·89
(4)	„ 900·79	(16)	„ 2668·19
(5)	„ 960·09	(17)	„ 2727·49
(6)	„ 1019·39	(18)	„ 2786·79
(7)	„ 1078·69	(19)	„ 3403·64
(8)	„ 1636·24	(20)	„ 3462·94
(9)	„ 1695·54	(21)	„ 3522·24
(10)	„ 1754·84	(22)	„ 3581·54
(11)	„ 1814·14	(23)	„ 3640·84
(12)	„ 1873·44	(24)	„ 3700·14

87. Now the longitude of the Mars is 7°·1 on the Zero-date; it will take 1·0066 years to become 199°·75 and the longitude of the Sun that is 0 on the Zero-date will take 0·68 years to become 245°. Therefore we get the equations:—

$$T = 0{\cdot}68 + 1 \times (\text{Full Revolutions of the Sun})$$

$$= 1{\cdot}0066 + 1{\cdot}8808 \times (\text{Full Revolutions of the Mars}).$$

Or

$$\frac{0{\cdot}327 + 1{\cdot}8808 \times (\text{Full Revolutions of the Mars})}{1}$$

$$= \text{Full Revoutions of the Sun.}$$

Or approximately,

$$\frac{112 + 647 \times (\text{Full Revolutions of the Mars})}{344}$$

$$= \text{Full Revolutions of the Sun.}$$

The following are the solutions of this indeterminate equation:—

	Revolutions of the Sun	Revolutions of the Mars	Time in Years
(1)	Minus 105	Minus 56	Minus 104·32
(2)	„ 752	„ 400	„ 751·32
(3)	„ 1399	„ 744	„ 1398·32
(4)	„ 2046	„ 1088	„ 2045·32
(5)	„ 2693	„ 1432	„ 2692·32
(6)	„ 3340	„ 1776	„ 3339·32
(7)	„ 3987	„ 2120	„ 3986·32

88. These years would give the desired position of the Mars and the Sun exactly, while a large number of years at an interval of 13, 15, 17, 32, 45, 47, 49, 64, 79, 158, 188, 284 or 363 years or their combinations from these years obtained above, would give the same position approximately. It is difficult to give a list of such a large number. Therefore we would only see if the years of the Jupiter and the Saturn also fall in the list of years for the Mars by seeing whether the interval between the year of the Jupiter and the Saturn and that of the Mars given above is equal to the sum or difference of the periods 13, 15, 17, 32, etc., given above. Thus the year minus 841·49 differs from minus 751·32 by 90 which is equal to the sum of 45 and 45. Therefore this year falls in the list of years of the Mars also. The year minus 900·79 differs from minus 751·32 by 149. This is not equal to the sum or difference of any of the numbers given above. Therefore the year minus 900·79 does not fall in the list of years for the Mars. In this way we get the following years only that fall in the list of years of the Jupiter and the Saturn and also in the list of years for the Mars.

(1) Minus 841·3
(2) „ 1078·3
(3) „ 1695·3
(4) „ 1932·3

(5) Minus 2549·3
(6) „ 2786·3
(7) „ 3403·3
(8) „ 3640·3

89. It should be noted that the intervals between these years are 237 and 617 years alternately. This order shows that we have got all the probable years here in this list. It should be noted that the fractional part of the years of the Jupiter and the Saturn is to be taken 0·3; for by this way only we get the Sun's desired position, *i.e.*, 252°. From these we have to select those that give eclipses in the Kārtika.

90. The minimum longitude of the Sun, on the Amāvāsyā of the Kārtika was 216° and the maximum would be 272° (see *supra*, para. 56). Therefore, the approximate longitude of the Sun on the Amāvāsyā of the Kārtika was 244°; therefore that on the previous Pourṇimā would be 229°. Therefore the longitude of the Rāhu would be 229° or 49°.

91. Now the Rāhu or the Ketu takes the same position again after 19, 37, 93, or 3199 years and thus it follows that eclipses would happen in the same month again after 9, 19, 28, 37, 65, 93, 1646 or 3199 years. Now the longitude of the Rāhu is 11 signs, 22°, 12′ on the Zero-date. It would become 49° in the Kārtika in the year plus 15·7 and would then give eclipses in the Kārtika according to the calendar of those days. From this we can derive a large number of years that would give eclipses in the Kārtika. We should, therefore, see if each of the years given above can give eclipses in the Kārtika. The year minus 841·3 differs from plus 15·7 by 857 which is equal to 9 × 93 plus 20. This year, therefore, is very near the year that can give eclipses in the Kārtika and must, therefore, be accepted as probable. The year minus 1695·3 differs from plus 15·7 by 1711 which is equal to 1646 plus 65. This year is, therefore, acceptable. The year minus 3640·3 differs from plus 15·7 by 3656 which is equal to 3199 plus 93 × 4 plus 65 plus 20 and must be

accepted as probable. But the year minus 1932·3 differs from 15·7 by 1948 which is equal to 1646 plus 3 × 93 plus 23 and must be rejected. In this way we get the following probable years only:—

Minus 841·3
„ 1695·3
„ 3640·3

92. Both the years minus 841·3 and minus 3640·3 being beyond the limits previously settled, *i.e.*, 1162 and 3102 B.C., *i.e.*, minus 1660 and minus 3600, the only acceptable year is minus 1695·3 from the first group, especially as the year minus 3640·3 does not give the eclipses as required when actual calculation is made.

93. Now we shall find the year from the second group. In this group the Venus is stationary, *i.e.*, it is at a distance of 29° from the Sun. The Venus is riding on the *Pūrva Proshṭhapada*; that can mean that it is in the *Śatatārakā* or in the *Pūrvabhādrapadā* or even in the *Uttarābhādrapadā*. The minimum longitude of the *Śatatārakā* is 307° and therefore the minimum longitude of the Sun would be 278°. And we know that the maximum longitude of the Sun is 289° at the beginning of the War. Thus the longitude of the Sun cannot be less than 278° and cannot be greater than 289°. Therefore we can conclude that the longitude of the Sun is approximately 278° and that of the Venus is 307°. The longitude of the star Maghā is 130°. The minimum longitude of the Mars would thus be 117° and let us take it that the longitude of the Mars is 117°. Let us take the longitude of the Jupiter to be 290°. Thus the true approximate longitudes are:—

Sun	.. 278°
Venus	.. 307°
Mars	.. 117°
Jupiter	.. 290°

The mean longitudes of these are:—

Sun	..	277°
Venus	..	85°
Jupiter	..	296°
Mars	..	104°

The longitude of the Mars is 7° on the Zero-date; it will take 0·506 years to become 104°. The longitude of the Jupiter is 187° on the Zero-date; it will take 3·591 years to become 296°. Therefore we get the following equations :—

$$T = 3{\cdot}591 + 11{\cdot}861764 \times \text{(Full Revolutions of the Jupiter)}$$

$$= 0{\cdot}506 + 1{\cdot}880815 \times \text{(Full Revolutions of the Mars)}.$$

Or

$$\frac{-3{\cdot}085 + 1{\cdot}880815 \times \text{(Full Revolutions of the Mars)}}{11{\cdot}861764}$$

$$= \text{Full Revolutions of the Jupiter.}$$

Or approximately,

$$\frac{-123 + 75 \times \text{(Full Revolutions of the Mars)}}{473}$$

$$= \text{Full Revolutions of the Jupiter.}$$

From this we get the following solutions:—

Revolutions of the Jupiter	Revolutions of the Mars	Years
Plus 24	Plus 153	..
Minus 51	Minus 320	Minus 601·34
„ 126	„ 793	„ 1490·965
„ 201	„ 1266	„ 2380·59
„ 276	„ 1739	„ 3270·215
„ 351	„ 2212	„ 4159·84

Of these we can accept only minus 3270·215; for it only has as its fraction 0·215 without which we cannot get the

desired position of the Sun. But we can get other years also by adding to those obtained above, periods of some full revolutions of the Mars that have a period approximately equal to the period of some full revolutions of the Jupiter. For this purpose we should use the following table:—

Revolutions of the Mars	Time (Years)	Revolutions of the Jupiter	Time (Years)
6	11·284890	1	11·861764
19	35·735485	3	35·585292
25	47·020375	4	47·447056
63	118·491345	10	118·61764
82	154·226830	13	154·202932
107	201·247205	17	201·649988
120	225·697800	19	225·383516
126	236·98269	20	237·23528
227	426·945005	36	427·023504
473	889·625495	75	889·6323
839	1578·003785	133	1577·614612

In this way we get the following years:—

Minus 1124·207	Minus 1976·214	Minus 3270·216
„ 1171·227	„ 2023·234	„ 3317·236
„ 1218·247	„ 2702·210	„ 3554·218
„ 1408·210	„ 2749·230	„ 3601·238
„ 1455·23	„ 2796·250	„ 3791·200
„ 1692·212	„ 2986·212	„ 3838·220
„ 1739·232	„ 3033·232	„ 3885:240

Now we shall find the equation for the Venus. The longitude of the Venus is 356° at the Zero-date; it will take 0·1609 years to become 85°. The longitude of the Sun that

is zero degree on the Zero-date will take 0·77 years to become 277°. Therefore, we get the following equations:—

$T = 0 \cdot 1609 + \cdot 6152 \times$ (Full Revolutions of the Venus)

$= 0 \cdot 77 +$ (Full Revolutions of the Sun).

Or

$-0 \cdot 6091 + 0 \cdot 6152 \times$ (Full Revolutions of the Venus)

= Full Revolutions of the Sun.

Or approximately,

$$\frac{-473 + 478 \times \text{(Full Revolutions of the Venus)}}{777}$$

= Full Revolutions of the Sun.

The solutions of this equation are:—

Revolutions of the Venus	Revolutions of the Sun	Time (Years)
Plus 422	Plus 259	Plus 259·77
Minus 355	Minus 219	Minus 218·23
" 1132	" 697	" 696·23
" 1909	" 1175	" 1174·23
" 2686	" 1653	" 1652·23
" 3463	" 2131	" 2130·23
" 4240	" 2609	" 2608·23
" 5017	" 3087	" 3086·23
" 5794	" 3565	" 3564·23
" 6571	" 4043	" 4042·23

The Venus and the Sun attain the same position again after 8, 235 or 478 years. We shall test, therefore, the years of the Jupiter and the Mars for the Venus, as we tested the years of the Jupiter and the Saturn for the Mars in the first group. For example, minus 1692·2122 differs from minus 1652·23 by 40 years that are equal to 8 × 5. Therefore, minus 1692·2122 is the year that will give us the desired

positions of the Mars, the Jupiter, the Venus and the Sun. Minus 1455·23 differs from minus 1174·23 by 281 years that are equal to 235 plus 8 × 5 plus 6 years. This year is therefore, to be rejected. In this way we get only three years.

Minus	1692·2122
,,	3270·21599 (by courtesy)
,,	3791·200

None of these years stand the test of eclipses in the Kārtika and are therefore to be rejected. The last is also beyond the limits previously settled.[28]

94. We thus get only one year from both the groups as the year of the War. In this year we get an eclipse of the Sun at a place whose latitude is 30° 17′ and longitude is zero from Ujjayini, of the magnitude of about 18½ minutes (the Sun's disc being 32′·5) at 21 Ghaṭīs 45 Palas from mean sunrise on Friday the Amāvāsyā of the Āświna that is, on 5 days, 21 Ghaṭīs, 45 Palas calculated from sunrise of Sunday. We get an eclipse of the Moon, of the magnitude of about 24′·4 (Moon's disc being 33′) at the same place, on the Pourṇimā of the Kārtika on Friday at 19 days, 37 Ghaṭīs, 18 Palas, the time of contact being 33 Ghaṭīs, 46 Palas and the time of Moksha (Egress) being 40 Ghaṭīs, 50 Palas. This agrees exactly with the statements about eclipses referred to previously, namely, that one eclipse of the Sun and one of the Moon took place on the same day (Friday) of the week and in one month. It also agrees with the statement

सोमस्य लक्ष्म व्यावृत्तं राहुरर्कमुपैति च ॥ ११ ॥[29]

discussed in *supra*, para. 81.

For though a solar eclipse had already happened another in the same month could be expected.

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[28] *See supra*, para. 59.

[29] *Udyoga Parva*, Chapter 143.

It also agrees with

अलक्ष्यः प्रभया हीनः पौणमासीं च कार्तिकीम् ।
चंद्रोऽभूदग्निवर्णश्च समवर्णे* नभस्तले ॥ २३ ॥[30]

[*Translation.*—" On the Pourṇimā of the Kārtika, the Moon became imperceptible, devoid of lustre, and of the colour of fire, while the sky was of normal, *i.e.*, blue colour."]

For, this is the description of the Moon just before it is eclipsed, the change in colour being caused by the penumbra in which the Moon then enters.

It is also clear that if it was the 13th *Tithi* by the calculation of those days on the day of the solar eclipse, it was also the 13th *Tithi* by the same calculation on the day of the lunar eclipse; for, the duration of 15 *Tithis* was 14 days, 46 Ghaṭīs approximately even then. Therefore, if the 13th *Tithi* ended at 5 days, zero Ghaṭīs, that in the next *Paksha* will end at 19 days, 46 Ghaṭīs and therefore, it would be the 13th *Tithi* at 19 days, zero Ghaṭīs, one *Tithi* having the duration of about 59 Ghatīs.

96. The eclipses, therefore, clearly prove that the year of the War is minus 1695·3, *i.e.*, 1197 B.C.

97. This conclusion is confirmed by the following considerations that fix the identity of the year.

98. (1) An eclipse is mentioned to have happened at the time when the Yādavas perished fighting with each other. This is stated in the verses already referred to (see *supra*, para. 47). They mean that a solar eclipse happened at Dwārakā at the time. And we get a solar eclipse at Dwārakā of the magnitude of about 14′·6 (the Sun's disc being 32′) 270 lunar months after the solar eclipse in the year minus 1695·3, at 5 days, 22 Ghaṭīs, 25 Palas from mean sunrise at

* *Note.*—This is the reading in the Madras Edition and I have taken it as its meaning is more certain, while the meaning of the Bombay reading (श्यामवर्णे) may be "blue or red like a lotus".

[30] *Bhīshma Parva*, Chap. 2.

Dwārakā. We get a lunar eclipse also on the next Pourṇimā, of the greatest magnitude of 28′ (Moon's disc being 29′·6) at 5 days 58 Ghaṭīs, 23 Palas from mean sunrise at Dwārakā. Thus in this year also we had one solar and one lunar eclipse in one month both on Friday as in the year minus 1695·3. The lunar eclipse is not mentioned in the *Mausala Parva* but that does not matter. We learn definitely that a solar eclipse happened. It happened 270 lunar months after the solar eclipse of the year minus 1695·3, that happened on the Amāvāsyā of the Āświna; therefore it must have happened on the Amāvāsyā of the Bhādrapada about 22 years after. [The *Vedānga-Jyotisha* was in vogue in the year minus 1695·3 (see *Dixit*, page 88). On the Amāvāsyā of the month, named Kārtika by us, the Sun was in the Jyeshṭhā. This happens in the Kārtika in *Idāvatsara*, the third of the cycle of five years of the *Vedānga-Jyotisha* (see *Dixit*, page 77) or in the Mārgaśeersha in *Idvatsara*, the fifth year of the cycle. (see *Dixit*, page 78). But we shall see hereafter in paragraph 235 that in the year of the War the Vishuva happened on the fourth *Tithi* of the bright half of the Kārtika. This happens in the *Idāvatsara* and not in *Idvatsara* (see *Dixit*, page 91). The War was, therefore, begun on or after the Amāvāsyā of the month named Kārtika then also. It is also thus proved that the War was fought in *Idāvatsara*, the third year of the cycle. From the Āświna Amāvāsyā of that year to the end of that cycle we have 28 months; the next four cycles would be of 62 months each. But one month must have been omitted during this period to correct the mistake in the Sun. This makes 275 months from the solar eclipse of the year minus 1695·3 to the end of that fourth cycle. Five months before that we get the Amāvāsyā of the Bhādrapada.]

99. The Pāṇḍavas were exiled just after they performed the Rājasūya and proclaimed themselves Emperors. They passed about thirteen years from the exile to the War, and from the War to this solar eclipse on the Amāvāsyā of the Bhādrapada, they passed 22 years. That accounts for the

approach of the 36th year spoken of in the *Mausala Parva*, Chapter 2, verses 20-21, in the *Strī Parva*, Chapter 25, verse 44, and in the *Mausala Parva*, Chapter 1, verses 1 and 13, which say that the Yādavas perished when the 36th year had arrived. (All these verses are given in the footnote with their translations.[31]) The time appears to have been counted from the Rājasūya when perhaps the Pāṇḍavas might have begun an Era that was not continued long afterwards. Thus this solar eclipse also confirms the date of the War found out by us.

100. (2) A solar eclipse is referred to in

राहुरग्रसदादित्यं अपर्वणि विशांपते ॥ १९ ॥[32]

This is addressed to Dhṛitarāshṭra at the time of the play at dice which resulted in the exile of the Pāṇḍavas, *i.e.*, about

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[31] विमृशन्नेव तं कालं परिचिंत्य जनार्दनः ।
मेने प्राप्तं स षट्त्रिंशं वर्षं वै केशिसूदनः ॥ २० ॥
पुत्रशोकाभिसंतप्ता गांधारी हतबांधवा ।
यदनुव्याजहारार्ता तदिदं समुपागतम् ॥ २१ ॥ मौसलपर्व, अ. २.
यस्मात्परस्परं घ्नंतो ज्ञातयः कुरुपांडवाः ।
उपेक्षितास्ते गोविंद तस्माज्ज्ञातीन् वधिष्यसि ॥
त्वमप्युपस्थिते वर्षे षट्त्रिंशे मधुसूदन ॥ ४४ ॥ स्त्रीपर्व, अ. २५.
षट्त्रिंशे त्वथ संप्राप्ते वर्षे कौरवनंदनः ।
ददर्श विपरीतानि निमित्तानि युधिष्ठिरः ॥ १ ॥
षट्त्रिंशेऽथ ततोवर्षे वृष्णीनामनयो महान् ।
अन्योन्यं मुसलैस्तेतु निजघ्नुः कालचोदिताः ॥ १३ ॥ मौसलपर्व, अ. १.

Translation.—Considering those times, Śree Kṛishṇa thought that the 36th year, which Gāndhārī afflicted with the grief for the loss of her sons spoke of, had approached . . . (20, 21). "Oh Kṛishṇa, as you connived at the kinsmen the Kauravas and the Pāṇḍavas, killing each other, you will also kill your kinsmen when the 36th year will approach (44). When the 36th year had approached Yudhishṭhira saw bad omens (1). When the 36th year had approached, the Yādavas committed the extremely wrongful act of killing each other by Musalas, being impelled by Destiny (13).

[32] *Sabhā Parva*, Chapter 79.

13 years before the War. Wonderfully enough, we get a solar eclipse 164 lunar months before the solar eclipse in the year of the War in the Śrāvaṇa by the calendar of that time. It was a total eclipse in India but at Hastināpura whose lattitude is here taken to be 30° 17′ it was of the magnitude of about 19′, Sun's disc being 32′ at 18 Ghaṭīs, 20 Palas from mean sunrise. This eclipse, of course, occurred about two *Tithis* before the Amāvāsyā by the calendar of those days. This explains the word 'अपर्वणि' [see *supra*, para. 50 (5)]. This also confirms the identity of the year.

101. (3) The planets at the time of the killing of Kansa by Śree Kṛishṇa have been given in the *Harivanśa* in the following verses:—

एष घोरोग्रहः स्वातिमुल्लिखन्खे गभस्तिभिः ।
वक्रमंगारकश्चक्रे चित्रायां घोरदर्शनः ॥ २५ ॥
बुधेन पश्चिमा संध्या व्याप्ता घोरेण तेजसा ।
वैश्वानरपथे शुक्रो ह्यतिचारं चचार ह ॥ २६ ॥
ग्रस्तः स्वर्भानुना सूर्यो दिवानक्तमजायत ॥ ३१ ॥[33]

[*Translation.*—" This terrible planet Mars as if writing on the Swāti with its rays has entered the Chitrā by retrograde motion. The western twilight has been occupied by the Mercury with its terrible light, and the Venus has entered the " Path of the Fire " by moving more rapidly than usual. The Rāhu had so eclipsed the Sun that it became night even in daytime."]

These statements are very clear and there is no ambiguity about them as there is about many statements in the *Mahābhārata*.

102. We are wonderstruck to see that the positions of the planets in the year minus 1734·54121, that is 39·54121 years before the Mahābhārata War, [illegible] exactly agree with statements given above. They are as follows:—

[33] *Harivanśa*, *Vishṇu Parva*, Chapter 23.

Planet	Longitude			Constellation and Remarks
	Signs	Degrees	Minutes	
Sun ..	1	27	40	Mṛiga
Mars ..	6	5	38	Chitrā. Retrograded from the Swātī to the Chitrā.
Venus ..	0	28	42	Kṛittikā. Motion very rapid, increasing every day.
Mercury .	2	15	16	Seen in the Evening

103. It is quite easy to see that this agrees with the statements given above. One point only is to be explained. The Venus is said to have entered the "Path of the Fire". In the *Śatapatha Brāhmaṇa* the Nakshatras for consecration of the Fire begin with the Kṛittikā and, end in the Chitrā and it is also stated "स यत्रोदगावर्तते तर्हि अग्नीनादधीत".

"[When the Sun moves in the North of the Equator then one should perform consecration of the Fire.] This shows that other Nakshatras are omitted because they were to the South of the Equator and that the Nakshatras from the Kṛittikā to the Chitrā were to the North of the Equator and that the Kṛittikā was the first Nakshatra in the Hemisphere North of the Equator. The Northern Hemisphere is thus the "Path of the Fire". Entering the "Path of the Fire" means, therefore, entering the Kṛittikā or going to the North of the Equator. In the calculated positions also we get the Venus to be equal to 0/28°/42′. Deducting the Ayananśas 0/25°/27′ we get 0/3°/15′. This shows that the Venus has just entered the Northern Hemisphere. Thus there is exact agreement of the calculated Venus with that in the statement.

104. The solar eclipse also happened at Mathurā 493 lunar months before the solar eclipse of the year minus 1695·3 (*i.e.*, about five lunar months before the date, the positions of the planets on which we have given above).

The greatest magnitude of it was 30′ (Sun's disc being 32′·5) at 13 Ghaṭīs 29 Palas from mean sunrise at Mathurā. This eclipse was thus sufficiently large to cause night in daytime.

105. This close agreement of calculations with the statements in the *Harivanśa* proves the identity of the date of the War as calulated by us with the real one, especially as the interval between the date of the War and the date of killing Kansa, *i.e.*, *minus* 1734·84121 *plus* 1695·3 or *minus* 39·54121 is also supported by statements in the *Mahābhārata* and the *Harivanśa*.

106. Śree Kṛishṇa was about 15 years of age when Kansa was killed. The statement that Śree Kṛishṇa had not yet manifested his youth when he killed Kansa[34] shows that he was not yet in his 16th year, the 16th year being the Indian age of majority. Śree Kṛishṇa and Arjuna were of the same age; for, when they met they embraced each other. The verse

समानवयसः सर्वानाश्लिष्य स पुनः पुनः ॥ २० ॥[35]

(He having embraced those of equal age) shows that relatives of equal age embraced each other. The verses,

आमंत्र्य प्रययौ श्रीमान् पांडवान् मधुसूदनः ।
अभिवाद्य महाबाहुं धर्मराजं युधिष्ठिरम् ॥ ४५ ॥
राज्ञा मूर्धन्युपाघ्रातो भीमेन च महाभुजः ।
परिष्वक्तश्चार्जुनेन यमाभ्यां चाभिवादितः ॥ ४६ ॥[36]

(Śree Kṛishṇa departed having taken leave of the Pāṇḍavas, bowing down to Yudhishṭhira, being scented on his head by Bhīma to confer benedictions, having been embraced by Arjuna and being bowed down by Nakula and Sahadeva) and

ततोऽभ्यगच्छत्कौंतेयं सखायं तत्र माधवः ॥ ४ ॥
तावन्योन्यं समाश्लिष्य पृष्ट्वा च कुशलं वने ॥[37]

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[34] अव्यक्तयौवनं कृष्णमक्रूरः प्रशशंस ह ॥ १९ ॥
Vishṇu Parva, Chapter 25. (*Translation*,—Akrūra praised Śree Kṛishṇa who had not manifested his youth.)

[35] *Ādi Parva*, Chapter 218.

[36] *Vana Parva*, Chapter 22.

[37] *Ādi Parva*, Chapter 218.

(Then Śree Kṛishṇa went to his friend, Arjuna. They having embraced each other and having asked each other if they were happy) show that Śree Kṛishṇa and Arjuna embraced each other when they met. This shows that Śree Kṛishṇa and Arjuna were of almost equal age.

107. Arjuna was 33 years old when he burned the Khāṇḍava forest. The following verse shows this:—

एकांतविजयस्त्वेव श्रूयते पांडवस्य ह ।
त्रयस्त्रिंशत्समाऽऽहूय खांडवेऽग्निमतर्पयत् ॥ १० ॥[38]

[*Translation.*—"It is heard that Arjuna is invariably victorious; for even at the age of 33, he invited and gratified Fire in the Khāṇḍava forest."]

Chapters 221 and 222 of the *Ādi Parva* show that Abhimanyu was born just before the burning of that forest; and that the thread-ceremonies of all sons of the Pāṇḍavas were performed before the Pāṇḍavas were exiled. According to *Manusmṛiti* the thread ceremony of a Ksatriya is to be performed between the ages of six and eleven years. Thirteen years passed between the beginning of the exile and of the War. Therefore it follows that the age of Abhimanyu at the time of the War may be about 8 *plus* 13, *i.e.*, 21, and that of Arjuna, 21 *plus* 33, *i.e.*, 54. This is confirmed by the description of Abhimanyu at the time of War as a *Śiśu* (youth) and अप्राप्तयौवन (not having attained maturity). (See *Droṇa Parva*, Chapter 49, verse 33.) On the whole, we can take the age of Śree Kṛishṇa at the time of the War to be about 54 and that at the time of killing Kansa 15. Thus we get a period of about 39 years between the killing of Kansa and the War. This agrees with the dates calculated by us and confirms them.

108. Having thus calculated and got confirmed the exact year of the War, we shall find out the *Tithi* and the day when the War began.

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[38] *Udyoga Parva*, Chapter 52.

109. Bhīshma says at the time of his death:—

अष्टपंचाशतं रात्र्यः शयानस्याद्य मे गताः ।
शरेषु निशिताग्रेषु यथा वर्षशतं तथा ॥ २७ ॥
माघोऽयं समनुप्राप्तो मासः सौम्यो युधिष्ठिर ।
त्रिभागशेषः पक्षोऽयं शुक्लो भवितुमर्हति ॥ २८ ॥[39]

[*Translation.*—"I have passed fifty-eight nights on this bed of sharp arrows, as if they were hundred years. The month of the Māgha has come. This bright half deserves to be one which has yet to pass its third portion, *i.e.*, ten *Tithis* of the bright half have passed."]

110. In the year of the War, *i.e.*, 1197 B.C. the *Vedānga-Jyotisha* had already come into existence (see *Dixit*, page 88) and in that *Jyotisha* the months began with the bright Paksha (see *supra*, para. 38). Presumably, therefore, the months in the *Mahābhārata* Calendar also began with the bright Paksha. It has also been proved independently in para. 147 that the months in the *Mahābhārata* Calendar began with the bright Paksha. We must, therefore, construe this verse accordingly. The verse says that the Māgha has arrived. This can be said only in the first part of the month and not in the last. Therefore the verse must be construed to mean that Bhīshma died in the first half, that is, the bright Paksha of the Māgha and it has been construed here accordingly. Again, the question is "Why does Bhīshma use the word "भवितुमर्हति" (deserves to be) instead of the simple word 'भवति' (is)? The mistake of two *Tithis* in the calculated *Tithi* found out at the time of the eclipses[40] made such a language necessary. On account of the discovery of this mistake, though the *Tithi* of the calendar of those days was the eighth, Bhīshma had to say that it was proper to say that ten *Tithis* of the bright half had passed. Therefore, the *Panchānga Tithi* at the death of Bhīshma was the eighth of the

[39] *Anuśāsana Parva*, Chapter 167.
[40] *Vide supra*, para. 46.

bright half of the Māgha. Bhīshma slept on the bed of arrows on the 10th day of the War, *i.e.*, he slept in his tent for nine nights and on the arrows for 58 nights; that makes 67 nights or 68 *Tithis.* Thus calculated the War must have begun on the Amāvāsyā (by the calendar then in vogue) of the Kārtika as was proposed by Śree Kṛishṇa to Karṇa in "सप्तमाच्चापि दिवसादमावास्या etc.", already discussed.[41]

111. Some construe this verse otherwise and say that Bhīshma died on the 4th of dark half of the Māgha, but they are mistaken as the following discussion will show.

112. Bhīshma died just after the Sun turned to the North; for he says:—

शिष्येऽहमस्यां शय्यायां यावदावर्तनं रवेः ॥ ५१ ॥
ये तदा मां गमिष्यंति ते च प्रेक्षंति मां नृपाः ।
दिशं वैश्रवणाक्रांतां यदा गंता दिवाकरः ॥ ५२ ॥
नूनं सप्ताश्वयुक्तेन रथेनोत्तमतेजसा ।
विमोक्ष्येऽहं तदा प्राणान् सुहृदः सुप्रियानिव ॥ ५३ ॥[42]

[*Translation.*—" I will sleep on this bed until the turning back of the Sun (to the North). Kings that come then will be able to see me. When the Sun will go in the Direction of Vaiśravaṇa, *i.e.*, the North, in his bright chariot drawn by seven horses, I will give up my lives that are dear like friends."] This shows that Bhīshma died just after the Sun turned to the North. The poetical statement that Bhīshma could control his death given in

धारयिष्याम्यहं प्राणानुत्तरायणकांक्षया ।
प्राणानां च समुत्सर्गे ऐश्वर्यं नियतं मम ॥ ११५ ॥
यश्च दत्तो वरो मह्यं पित्रा तेन महात्मना ।
छंदतस्ते भवेन्मृत्युरिति तत्तथास्तु मे ॥ ११६ ॥[43]

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[41] See *supra*, para. 53.
[42] *Bhīshma Parva*, Chapter 120.
[43] *Ibid.*, Chapter 119.

[*Translation.*—" I will hold my lives with the desire of getting Uttarāyaṇa, as I have got control over the giving up of my life. Let the boon given to me by my father that I will have my death at my will, become true"], must have originated in the fact that though lying wounded for 58 days he died immediately after the turning of the Sun to the North. Therefore Bhīshma died just after (say within two days after) the Sun turned to the North.

113. Now in the days of the War (*minus* 1695) the Equinox was 90° to the East of the Dhanishṭhā, and the Sun turned to the North when it entered the constellation Dhanishṭhā. So, Bhīshma must have died soon after the Sun entered the Dhanishṭha according to the calendar of those days. Now as already seen the Sun was in the Jyeshṭhā on the Kārtika Amāvāsyā according to the calendar of those days. Supposing the Sun was then just in the beginning of the Jyeshṭhā, the maximum period between that Amāvāsyā and the turning of the Sun to the North is that of 5 constellations of the Sun, *i.e.*, $\frac{366 \times 5}{27}$, *i.e.*, 68 days. Therefore Uttarāyaṇa began *within* 68 days from the Amāvāsyā of the Kārtika. And Bhīshma must have died within two days from the beginning of the Uttarāyaṇa. Therefore Bhīshma must have died within 70 days from the Amāvāsyā of the Kārtika.

114. Now as 67 days passed between the beginning of the War and the death of Bhīshma, the War must have begun on or within three days after the Amāvāsyā of the Kārtika. This confirms the conclusion already arrived at that the War began on the Amāvāsyā of the Kārtika. This also disproves the theory that Bhīshma died on the 4th of the dark half of the Māgha and that the War began on the 11th of the bright half of the Mārgaśīrsha. This also disproves the theory that the War began on the second *Tithi* of the dark Paksha, next after the Amāvāsyā referred to in सप्तमाच्चापि दिवसात् etc. (see *supra*, para. 53).

115. It was the 13th *Tithi* by the calendar on the morning of the day on which the solar eclipse took place. Let us, therefore, suppose that the 13th *Tithi* ended at sunrise of that day, *i.e.*, at 5 days zero Ghaṭīs. The next 13th *Tithi* would then end at 19 days 46 Ghaṭīs. The next Amāvāsyā would end at 36 days 29 Ghaṭīs, *i.e.*, on Monday at 29 Ghaṭīs, from sunrise. Therefore the War began on Monday and 29 Ghaṭīs is the minimum period of Amāvāsyā on the day on which the War began.

116. It is clear that the minimum duration of the 13th *Tithi* on the day of the Solar eclipse is zero Ghaṭīs. The maximum duration of the 13th *Tithi* on this very day cannot exceed 13 Ghaṭīs; for if we take the period greater than 13 Ghaṭīs, we do not get the 13th *Tithi* in the morning of the day of the Lunar eclipse; 14 *Tithis* being equal to 13 days 47 Ghaṭīs, the 13th *Tithi* would then commence after sunrise, *i.e.*, after zero Ghaṭīs. Thus it is proved that the duration of the 13th *Tithi* on the day of the solar eclipse was zero Ghaṭīs at the least and 13 Ghaṭīs at the greatest, the solar eclipse actually occurring during the 14th *Tithi*, as is shown by the statement in the *Mausala Parva* discussed in para. 47 and in para. 48. The duration of the Amāvāsyā of the Kārtika was, therefore, 29 Ghaṭīs in the least and 42 Ghaṭīs at the greatest on that Monday on which the War began.

117. We now give here the actual positions of the planets on that Monday which was really the Pratipadā (1st *Tithi*) of the Mārgaśīrsha and on a day 17 days from the same, *i.e.*, on the third *Tithi* of the dark half of the Mārgaśīrsha. The positions of the planets on Mārgaśīrsha Śuddha Pratipadā, Monday, morning, in the year *minus* 1695·3 are as follows :—

Planets	Mean Longitude in Degrees	True Longitude in Degrees	True Motion in Minutes	Constellation
Sun ..	251·8	251·8	..	Mūla
Venus ..	86·3	220·5	7·0	Anurādhā,* Retrograde only four days back
Mercury ..	167·92	233·0	..	Jyeshṭhā
Mars ..	235·6	235·45	..	Jyeshṭhā
Jupiter ..	215·68	218·25	..	Viśākhā
Saturn ..	209·43	215·63	..	Viśākhā
Moon ..	268	263·2	..	Pūrvāshāḍhā

Note.—If one calculates from my work named *Karaṇa-Kalpalatā* he should take *minus* 282 for Chakras and *minus* 1344 for days (*Ahargaṇa*). Time-correction has not been given to the Sun. The Moon has been calculated approximately and has been given time-correction on the supposition that, that of the Sun is zero.

On the 18th day from this Monday morning we get the following positions of planets, at mean sunrise :

Planets	Mean Longitude in Degrees	True Longitude in Degrees	True Latitude in Minutes	*Kālānśa* or the difference between the rising of Sun and the Planet in *Palas*
Sun ..	268·6	269·2	..	..
Venus ..	113·53	227·3	..	..
Mars ..	244·5	249·0	..	..
Mercury ..	237·49	258·2	– 48	126

118. These positions of the planets exactly agree with those in the *Mahābhārata*. They agree with the statement

* The retrograde Venus crossed the Jyeshṭhā and went into the Anurādhā.

"दीप्यमानाश्च संपेतुः etc." (All the seven planets being effulgent met together in the sky.) For, two days ago, the Moon was near the Mūla and could be seen in the East in the morning. Thus two days before the War began, all the seven planets stood from Viśākha to Mūla, six of them being at sufficiently long distances from the Sun to be effulgent and all the seven planets could be seen in the East in the morning.[44] This agrees exactly with the statement in the verse referred to. These positions also agree with the statement,

त्रिषु सर्वेषु नक्षत्रनक्षत्रेषु विशांपते ।
गृध्रः संपतते शीर्षं जनयन् भयमुत्तमं ॥ ३१ ॥[44a]

[*Translation.*—"Oh King, a greedy planet swoops on the head of each of all the three constellations that cause destruction to the Kshatriyas, and gives rise to the greatest alarm]; for, according to our calculations, the Saturn was in the Viśākhā, the Venus (that had just finished its retrogradation) was in the Anurādhā, and the Mars was in the Jyeshṭhā, and all these planets can be regarded as evil and greedy planets.

119. We have not made any use of the positions of the Venus and the Mercury for calculating the year. However, we get them, as required, in the East and effulgent. This further confirms the identity of the year and the *Tithi* also.

120. On the 18th day, the Kālānśas of the Mercury are 126. The Mercury cannot be seen if its Kālānśas are less than 130. On the 17th day the Kālānśas of the Mercury were 131½. Therefore the Mercury could be seen on the 17th day on which Karṇa was killed and could not be seen on the next day. This agrees exactly with the statement

"हते कर्णे.........सोमस्य पुत्रोऽभ्युदियाय तिर्यक् "

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[44] See *supra*, paragraphs 62–64.

[44a] *Bhīshma Parva*, Chapter 3.

(After Karṇa was killed the Mercury rose concealed.) This confirms the identity of the year and the *Tithi* still further very strongly. (See *supra*, paragraphs 72-75.)

121. Before the year *minus* 1695·3 and after passing through the Śravaṇa, the Mars became retrograde only twice and on both occasions its motion was of course, towards the Śravaṇa. This agrees exactly with

"वक्रानुवक्रं कृत्वा च श्रवणं पावकप्रभः। ब्रह्मराशिं समावृत्य etc.,"

which means that the Mars became retrograde towards the Śravaṇa twice. This also confirms the identity of the year (see *supra*, paragraphs 68 and 69).

122. We did not make use of the positon of the Mercury for finding the year. Calculation however shows that on the day on which the War began it is in the Jyeshṭhā. This agrees exactly with the following statement:—

श्यामो ग्रहः प्रज्वलितः सधूम इव पावकः।
ऐंद्रं तेजास्वि नक्षत्रं ज्येष्ठामाक्रम्य तिष्ठति ॥[45]

[*Translation.*—" The black planet, that is the Mercury dimly bright like a fire with smoke, stands in the bright constellation the Jyeshṭhā."]

123. This confirms the identity of the year calculated by us and also our conclusion regarding the *Tithi* on which the War began and incidentally refutes the theories that the War began on the 11th or the 14th *Tithi* of the bright half of the Mārgaśīrsha; for the Mercury which is a very fast moving planet and actually moved 25° in 17 days could not possibly have been in the Jyeshṭhā on the 11th or 14th *Tithi* of the bright half of the Mārgaśīrsha. This also refutes the theory that the War began on the second *Tithi* of the dark Paksha next following the Amāvāsyā referred to in the talk between Śree Kṛishṇa and Karṇa (see *supra*, para. 53).

[45] *Mahābhārata, Bhīshma Parva* (Madras Edition), Chapter 3, verse 16.

124. It may be objected here that the reading in this verse is "श्वेतो ग्रहः", *i.e.*, the Venus in the Bombay Edition. This objection is not tenable. The Madras Edition has got the reading " श्यामो ग्रहः", *i.e.*, the mercury and that is the acceptable reading. For, the planets, the Mercury and the Venus, form a couple, one member of the couple being called " श्याम " (black) and the other " श्वेत " (white). The names " श्याम " and " श्वेत " are expressive of the fact that they form a couple; therefore, when the " श्वेत " planet is described in one verse, *i.e.*, the 12th (श्वेतोग्रहस्तथा चित्रां समतिक्रम्य तिष्ठति etc.), the " श्याम " planet is most likely to be described in another. The Madras reading must, therefore, be the correct reading and must be accepted. We cannot have the description of the " श्वेत " both in the 12th and the 16th verse as in the Bombay Edition. One of these verses must refer to the " श्याम " and the Madras Edition shows that the 16th verse refers to the " श्याम ", *i.e.*, the Mercury.

125. Calculation shows that the Venus was retrograde and that it was stationary only four days before the War began. The Venus attains maximum of brilliancy about 15 days after it becomes stationary. Therefore the Venus attained maximum of brilliancy a few days before Karṇa's death. Now it is very difficult to say exactly, merely by observation by the eye, when a planet attains maximum of brilliancy. It is therefore quite possible that the Venus was thought to have attained maximum of brilliancy just after Karṇa's death. This agrees exactly with " श्वेतोग्रहश्च ज्वलनार्कवर्णः or तिर्यग् ग्रहश्च ज्वलनार्कवर्णः (see *supra*, paragraphs 72–74) whichever reading we accept; for both these readings mean that the retrograde Venus became as bright as fire or the Sun. This also confirms the identity of the *Tithi* of the beginning of the War.

126. The crossing of the Jyeshṭhā by the retrograde Venus and its position in the Anurādhā also exactly tallies with the correct interpretation of the following verse:—

कृत्वा चांगारको वक्रं ज्येष्ठायां मधुसूदन ।
अनुराधां प्रार्थयते मैत्रं संगमयन्निव ॥ ९ ॥[46]

[*Translation.*—" The planet Venus having become retrograde in the Jyeshṭhā aims at going into the Anurādhā as if to terminate friendly feeling " (for, Mitra, the friend, is the lord of the Anurādhā).]

127. It may be objected here that Angāraka means the Mars and not the Venus as we have taken it to mean. But when the Mars is so near the Sun, that is at the greatest in the Uttarāshadhā, *i.e.*, only three constellations from the Sun, it cannot be retrograde. The Mars cannot be retrograde unless at least ten constellations apart from the Sun. We must, therefore, regard this verse to be an interpolation or to hold that it refers to the Venus. But we cannot infer an interpolation if an absurdity can be explained otherwise. We must, therefore, accept that this verse refers to the Venus if " अंगारक " or " आंगारक " can mean the Venus. And " अंगारक or आंगारक " can mean the Venus. For both the Mars and the Venus become very bright, as bright as Fire (अंगार) when retrograde and therefore " अंगारक " may have meant in ancient language either the Mars or the Venus and in later language the word may have become restricted to the Mars. Or, the word in चांगारक may be आंगारक and आंगारक can mean a descendant of अंगारक (Fire) or the correct reading may be अंगारज as suggested by my preceptor Śreeyuta S. K. Barlingay and that also can mean a descendant of Fire, *i.e.*, the Venus. That the Venus is a descendant of Fire is known from the following statements in the *Mahābhārata* itself.

भृगुर्महर्षिर्भगवान् ब्रह्मणा वै स्वयंभुवा ।
वरुणस्य क्रतौ जातः पावकादिति नः श्रुतं ॥ ८ ॥[47]

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[46] *Udyoga Parva*, Chapter 143.

[47] *Ādi Parva*, Chapter 5.

ब्रह्मणो हृदयं भित्वा निःसृतो भगवान् भृगुः ।
भृगोः पुत्रः कविर्विद्वान् शुक्रः कविसुतो ग्रहः ॥ ४२ ॥[48]

["The sage Bhṛigu was born from fire in the sacrifice of Varuṇa on account of the Brahman. Bhṛigu came out of the heart of the Brahman. From Bhṛigu was born the planet Śukra (Venus) also called Kavi and Kavisuta".] In conclusion the verse under consideration refers to the Venus and states that the Venus having crossed the Jyeshṭhā is standing in the Anurādhā at the beginning of the War.

128. It may be objected again that the Venus was in the Swāti as stated in the verse

श्वेतोग्रहस्तथा चित्रां समतिक्रम्य तिष्ठति ।
अभावं हि विशेषेण कुरूणां तत्र पश्यति ॥ १२ ॥[49]

This verse when translated means "Venus stands in the Ṣwāti, of course, having crossed Chitrā and it shows the destruction of the Kurus." At the time of the War the Venus cannot be retrograde in the Chitrā because there it is more than 29° from the Sun, the Sun being at least in the Jyeshṭhā. Therefore according to this verse the Venus stands in the Swāti having crossed the Chitrā. This is opposed to what we get in the year minus 1695·3 by calculation. This is the objection against the identity of the year.

129. But we have calculated the year from data about which there can be no dispute. The year cannot, therefore, be wrong while the reading of the text can be wrong and mistaken. Moreover calculations given in the following tables show that we do not get the Venus in the Swāti after the Amāvāsyā on which the Sun was in the Jyeshṭhā in any of the years in which we get the required positions of the Saturn, the Jupiter and the Mars.

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48 *Ādi Parva*, Chapter 66.
49 *Bhīshma Parva*, Chapter 3.

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The following table* gives for each of the years the mean *Tithi* and the mean Venus at a time when the mean Sun is 230°·4:—

The Year	Mean *Tithi*	Mean Venus in Degrees
(1) Minus 841·36	6·33	121·64
(2) „ 1078·36	24·54	32·0
(3) „ 1695·36	9·03246	50·8
(4) „ 1932·36	27·24	321·16
(5) „ 2549·36	11·73	339·96
(6) „ 2786·36	29·94	250·32
(7) „ 3403·36	14·43	268·12
(8) „ 3640·36	2·64	178·48

* The calculations in this table and the next are somewhat approximate.

To these mean *Tithis* we add or subtract something to give *plus* 2; (for the actual *Tithi* on the Amāvāsyā of the Kārtika was the 2nd *Tithi*) and we make corresponding addition to the mean Sun and the mean Venus and find the true Geocentric Venus from them. The mean Sun that we get must be between the minimum and maximum limits of the Sun at the beginning of the War, *i.e.*, between 216 and 289 degrees. The following table shows these calculations :—

The Year	*Tithis* added or deducted	Mean Sun, Longitude in Degrees	Mean Venus, Longitude in Degrees	True Venus, Longitude in Degrees	Constellation of the Venus
Minus 841·36	− 4·33	226	115	184	Chitrā
	+ 25·67	255	162	218	Viśākhā
	+ 55·67	284	209	253·5	Pūrvāshāḍhā
,, 1078·36	+ 7·46	237·7	44	267·7 R	Uttārāshāḍhā
	+ 37·46	266·8	91	256·8 R	Pūrvāshāḍhā
,, 1695·36	+ 22·97	251·74	86·8	220 R	Anurādhā
	+52·97	280·84	133·8	235	Jyeshṭhā
,, 1932·36	+ 4·76	235	328	272	Uttarāshāḍhā
	+ 34·76	264	15	306	Dhanishṭhā
,, 2549·36	+ 20·27	250	12	295	Dhanishṭhā
	+ 50·27	279	59	325	Śatatārakā
,, 2786·36	+ 2·06	232·4	253	241	Mūla
	+ 32·06	261·5	300	276·5	Uttārāshāḍhā
,, 3403·36	+ 17·57	248	295	267	Uttarāshāḍhā
	+ 47·57	277	342	304	Dhanishṭhā
,, 3640·36	− 0·64	230	178	208·5	Viśākhā
	+ 29·36	259	225	245	Mūla
	+ 59·36	288	272	281	Śrāvaṇa
	— 10·77	220	162	196	Swāti

Here R means Retrograde.

This table shows that only in the two years namely minus 841·36 and minus 3640·36 do we get the Venus in the Swāti. Both these years are beyond the limits already settled by us. Therefore we can say that in no year within the limits determined by us, do we get the Venus in the Swāti after the Amāvāsyā on which the Sun is in the Jyeshṭhā. It should be noted that though in the year *minus* 3640·36 the Venus is in the Swāti, it is so before the Amāvāsyā on which the Sun is

in the Jyeshṭhā and not after as we require and therefore this year cannot be said to satisfy the condition that the Venus should be in the Swāti.

130. As we do not get any year in which the Venus is in the Swāti, we have to suppose that there is some mistake in the reading of the text. I suggest the following reading of the text that I think to be the correct one.

श्यामो ग्रहः प्रज्वलितः सधूम इव पावकः ।
ऐंद्रं तेजस्वि नक्षत्रं ज्येष्ठामाक्रम्य तिष्ठति ॥ १६ ॥
श्वेतो ग्रहस्तथा चैतां समतिक्रम्य तिष्ठति ।
अभावं हि विशेषेण कुरूणां तत्र पश्यति ॥ १२ ॥
ध्रुवं प्रज्वलितो घोरं अपसव्यं प्रवर्तते ।
रोहिणीं पीडयत्येवं उभौ च शशिभास्करौ ॥ १७ ॥

Here I suggest for the word चित्रां the reading चैतां. चैतां and चित्रां being much similar in writing, चित्रां could have been misread for चैताम्. I also suggest and hold that in the original text the verse about the Sweta must have followed that about the Śyāma because both must be near each other and because the verse that contains the words "तथाच" (and also) must follow the other verse and not precede it. The translation of this corrected reading is "The black planet Mercury dim like fire with smoke is standing in the bright constellation the Jyeshṭhā and also the white planet Venus stands having crossed the same constellation and shows the destruction of the Kurus, the sons of the eldest (ज्येष्ठ) brother Dhṛitarāshṭra. [Because the constellation Jyeshṭhā (ज्येष्ठा) is crossed over, the sons of the Jyeshṭha (ज्येष्ठ) *i.e.*, eldest brother must be destroyed.] Surely the planet being terribly resplendent, moves retrograde and afflicts the Rohiṇī, the Sun and the Moon." This is a very expressive description of the Venus that we get by calculation in minus 1695·3 at the beginning of the War. The year of the War being proved by the other undisputed evidence, suggests the corrections of reading proposed by me, and these correct readings in turn confirm the year. This is

the only logical course and we have already noted it in the first lecture.

131. Another objection is that according to the verse भृगुसूनु, etc., the Mercury was to the East of the Pāṇḍavas[50] and it must, therefore, have been seen on the 18th day of the War. But the calculations show that its Kālānśas being 126, *i.e.*, less than 130 on that day it could not be seen. How is it then described in the verse ? The explanation is this. Though it could not be seen on that day its position was known, because it was seen only the previous day and therefore the planet could be described. Or, the keener-sighted men of those ancient times may have seen it also, on the 18th day of the War, but not on the 19th day. Therefore the author of the *Bhārata*[51] could describe it as standing before the Pāṇḍavas on the 18th day of War and because it was not seen on the 19th day, *i.e.*, only one day after Karṇa's death, he could also say that the Mercury became invisible after Karṇa's death in "सोमस्य पुत्रोऽभ्युदियाय तिर्यक्" (see *supra*, paragraphs 72–75).

132. We see that the distances between the planets are greater on the 18th than on the 1st day of the War. On the 1st day the distance between the Sun and the Venus is 31°·3; that between the Mercury and the Mars is 2°·45; that between the Mercury and the Venus is 12°·5 and that between the Sun and the Mars is 16°·35. On the 18th day the same distances are 41°·9; 9°·2, 30°·9 and 20°·2 respectively. The same is true about the Saturn and the Jupiter whose distances from each other and from the Sun must be greater on the 18th day of the War than on the 1st day. Thus the planets are all separating from each other at the time of Karṇa's death. This is expressed very vividly in the following verse :—

निःसरंतो व्यदृश्यंत सूर्यात् सप्त महाग्रहाः ॥ ४ ॥[52]

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[50] See *supra*, paragraphs 70, 71.

[51] The *Bhārata* is the original work by Vyāsa and the *Mahābhārata* is the same increased in size by the additions made by subsequent editors.

[52] *Karṇa Parva*, Chapter 37.

We must take this to mean that all the seven great planets namely the Sun and others (सूर्यात् सप्त महाग्रहाः)[53] were seen separating from each other. This is opposed to "संपेतुः" (met together) in *Bhīshma Parva*, Chapter 17, verse 2.[54] Nīlkaṇṭha's commentary on this verse runs as follows:

"निःसरंतो युद्धार्थमिति शेषः ।
सूर्यात्सूर्यमारभ्य, सूर्यादयोन्योन्यं युद्धयंति इत्यर्थः"

This shows that Nīlkaṇṭha also supports our construction of "सूर्यात्सप्तमहाग्रहाः". He only differs about the meaning of "निःसरंतः". Our construction of the same, *i.e.*, "separating from each other" agrees with the positions of the planets of the minus year 1695·3 at the time of Karṇa's death as already shown.

133. Now we have to consider a very important objection namely that about the second group.[55] How can the positions of the planets of the second group be explained? They are the positions of the planets at the time of the finishing of the compilation of the *Bhārata* by Vyāsa.

134. That Vyāsa intended to write the history of the War and that he took three years to write it is clear from the following passages:—

अहं तु कीर्तिमेतेषां कुरूणां भरतर्षभ ।
पांडवानां च सर्वेषां प्रथयिष्यामि मा शुचः ॥[56]

[*Translation.*—" I will proclaim abroad the fame of the Kauravas and the Pāṇḍavas. Do not bevail."]

This shows that Vyāsa intended to write the *Bhārata* even before the War began. That Vyāsa took three years to compose the *Bhārata* is shown by the verse:

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[53] We cannot construe this otherwise; for the seven great planets include the Sun.

[54] See *supra*, paragraphs 62-65.

[55] See *supra*, para. 78.

[56] *Bhīshma Parva*, Chapter 2.

त्रिभिर्वर्षैः सदोत्थायी कृष्णद्वैपायनो मुनिः ।
महाभारतमाख्यानं कृतवान्महदद्भुतम् ॥ ५ ॥[57]

[*Translation.*—Kṛishṇa Dwaipāyana (Vyāsa) compiled the *Bhārata*[57a] in three years, being constantly engaged in the same."]

135. As Vyāsa was very old at the time of the War, he would commence the compilation immediately after the War for fear of his death preventing the compilation. But he could not have found any leisure for at least about two months from the commencement of the War, *i.e.*, until after the coronation of Yudhishṭhira was over. For, the War itself took 18 days and it was followed by mourning for thirty days (*Ṣānti Parva*, Chapter 1) and the coronation of Yudhishṭhira took about 12 days. We can, therefore, safely infer that Vyāsa finished the compilation of the *Bhārata* about 3 years and 2 months after the commencement of the War. The second group gives a date exactly agreeing with this. We had obtained three years from this group namely minus 1692·2122, minus 3270·21599 and minus 3791·200 and the first of these follows the date of the War minus 1695·3 by 3·08 years only, *i.e.*, 38 lunar months. This is quite decisive and shows that the second group corresponds to the finishing of the compilation of the *Bhārata* by Vyāsa.

136. We will, however, calculate positions of the planets in both the years minus 1692·2122 and minus 3270·21599 that are within the limits previously settled by us,[58] in order to remove some doubts that are likely to be taken against the year minus 1692·2122. Of course, we have to calculate the positions of the planets when the Venus would be stationary.

[57] *Ādi Parva*, Chapter 62.

[57a] *Note.*—The word *Mahābhārata* in this verse must be understood to mean the *Bhārata*; for the subsequent editor who must be the author of this verse must designate the *Bhārata* as the *Mahābhārata* to conceal the fact that he made additions to the *Bhārata*.

[58] See *supra*, para. 59.

Year	Mean longitude of the Sun in degrees	Mean longitude of the Venus in degrees	Mean longitude of the Mars in degrees	Mean longitude of the Jupiter in degrees
– 1692·228	278	84·14	103·85	308·5
– 3270·1	324	131·84	128·9	300·8

Year	True longitude of the Sun in degrees	True longitude of the Venus in degrees	True longitude of the Mars in degrees	True longitude of the Jupiter in degrees
– 1692·228	279	311; stationary in the Śata-tārakā	117·5 retro-grade in the Maghā	301·5; in Dhanishṭhā
– 3270·1	325·9	355·4; station-ary in the Rewatī	101·5; station-ary in the Pushya; was retrograde in the Maghā also	302·8; in Dhanishṭhā

137. This will show that the year minus 3270 does not satisfy the conditions of the second group. For, the Venus when stationary is in the Rewatī while we want it to be stationary in the Pūrvābhādrapadā, the Uttarābhādrapadā or the Śatatāraka.[59] Moreover the Sun being 325°·9 is much in excess of its maximum already determined upon. It cannot, therefore, be the year of the War. Nor can it be the year of the finishing of the compilation of the *Bhārata* by Vyāsa; for there is no year, three years previous to it satisfying the conditions of the 1st group. We must, therefore, conclude that the year minus 1692 is the only year that satisfies the conditions of the second group and that as it does not stand the test of the eclipses, it is not the date of the War but the date on which the compilation of the *Bhārata* was finished. It may be objected that in this year the Jupiter is not in the constellation Śravaṇa when the Venus is stationary. But this is a defect which is common to both the years minus 1692 and minus 3270. It is noteworthy however, that in

[59] *Bhīshma Parva*, Chapter 3, verse 15. See *supra*, para. 78.

both these years the Jupiter was actully in the Śravaṇa when it was retrograde. This suggests the construction of "मघास्वंगारको वक्रः श्रवणे च बृहस्पतिः" that "the Mars is retrograde in the Maghā and the Jupiter *was* retorgrade in the Śravaṇa". Thus we get the year minus 1692·228 from the second group as the date on which the compilation of the *Bhārata* was finished.

138. This is confirmed by the statement

चित्रास्वात्यंतरे चैव विष्ठितः परुषग्रहः ॥ १७ ॥[60]

(The Node is stationed between the Chitrā and the Swāti) which is beautifully and accurately explained by the date minus 1692·228. For, a partly seen lunar eclipse, *i.e.*, an eclipse in which the Moon set while partly eclipsed (ग्रस्तास्त), took place 29 lunar months after the lunar eclipse of the Kārtika of the year minus 1695·3 already referred to, at 1 day 3 Ghatīs 31 Palas (the middle of eclipse) and at the time the longitude of the Moon was about 182°. The longitude of both the Chitrā and the Swāti is 184° and the latitude is *minus* 2° and *plus* 30° respectively; the Moon was, therefore, almost on the straight line between the Chitrā and the Swāti. The place of the Rāhu is the same as the place of the Moon at the time of the eclipse. Therefore, it could be said that the Rāhu is stationed between the Chitrā and the Swāti. A subsequent lunar eclipse was seen six months later. But then the longitude of the Moon was about 353° and that will not remove the impression that the Rāhu was between the Chitrā and the Swāti. The year minus 3270·1 does not explain the statement we are discussing. This shows that we have found out the year correctly from the second group.

139. The statement in the second group that the Venus went round to the North (उत्तरे तु परिक्रम्य) was not made a basis for calculation of the date. However, we get this condition also on the date calculated and decided to be the date of the

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[60] *Bhishma Parva*, Chapter 3.

finishing of the compilation of the *Bhārata* by Vyāsa. Soliocentric longitude of the Venus is then 84° as already seen and the longitude of its Node is 57°·6. Therefore, its latitude is North and is also increasing, *i.e.*, its northern latitude is increasing, while being stationary its motion in longitude is zero. This would give an appearance that the planet turned round and went to the North. This exactly agrees with the description in the *Bhārata* and confirms the calculated date.

140. The date minus 1692·228 being thus only 3 years and 2 lunar months apart from the date of the War must be that of the finishing of the compilation of the *Bhārata* by Vyāsa. " Why then has the second group been given along with the first in the same chapter? " My theory is that this is one of the confusions created by the subsequent editors of the *Bhārata.*

141. As first composed by Vyāsa, the *Bhārata* must have contained only the history upto the coronation of Yudhishṭhira or the death of Bhīshma; for Vyāsa finished the work within 3 years after the War. The second group must have first stood at the end of this original compilation by Vyāsa. But when Vaishampāyana added the *Āśvamedhika* and other parvas to complete the history of the Pāṇḍavas, he could not allow the second group to remain where it was and for want of a better place, he put it in the same chapter as the first group. This is supported by the fact that the statements of the second group are found only in this one chapter and nowhere else. No better explanation of the existence of the two groups suggests itself and we are therefore constrained to accept it.

142. Thus it is proved beyond doubt that the War began in Idāvatsara (see *supra*, para. 98 parenthesis) on the Amāvāsyā of the Kārtika by the calendar of those days, *i.e.*, actually on Monday the Pratipadā of the bright half of the Mārgaśīrsha according to the calendar of those days but really of the Pausha in the year minus 1695·3.

143. We shall now enquire into the details of the calendar of those days. The *Vedānga-Jyotisha* came into existence in about 1400 B.C. (see *Dixit*, page 88). At the time of the War,* therefore, the *Vedānga-Jyotisha* or some modified form of it must have been in vogue. In the *Vedānga-Jyotisha*, the beginning of the first Yuga was to be determined by actual observation, as the verse स्वाक्रमेते, &c., shows (see *supra*, para 38). Such a beginning cannot be observed by the naked eye exactly. It must, therefore, have been taken, presumably, at sunrise; for, the Indians begin their day at sunrise. We, therefore, take it that the first Yuga began at sunrise. In the *Yajur-Vedānga-Jyotisha* the Yuga consisted of 1831 days, *i.e.*, a complete number of days (see *supra*, para 41). Therefore according to it every subsequent Yuga also must have begun at sunrise. The Amāvāsyā of the Kārtika of the Idāvatsara must, therefore, end according to the *YajurVedānga-Jyotisha*, at (1050 $-16\frac{58}{62}$ days from sunrise, *i.e.*, at about 4 Ghaṭīs from sunrise. But we have seen that this Amāvāsyā ended between 29 and 42 Ghaṭīs from sunrise (see *supra*, para. 116). It follows, therefore, that the *Yajur-Vedānga-Jyotisha* was not in vogue at the time of the War. A modified form of the *Yajur-Vedānga-Jyōtisha*, in which a ratio between days and *Tithis* more accurate than 61/62 was adopted, must have been in vogue at the time of the War. The first Yuga of this modified system also must have begun at sunrise.

144. We have seen that the maximum duration of the 13th *Tithi* of the dark half of the Āświna of the year of the War was 13 Ghaṭīs from sunrise and its minimum duration was zero Ghaṭīs from mean sunrise (see *supra*, para. 116). We would not be far from truth if we suppose that the duration of that 13th *Tithi* from sunrise was 6½ Ghaṭīs and that the duration of the Āświna Amāvāsyā was 4½ Ghaṭīs from mean sunrise. The duration of the Amāvāsyā of the preceding Śrāvaṇa would then be ¾ of a Ghaṭī from mean sunrise. Thus

there is no harm if we take it that the **Amāvāsyā** of the Śrāvaṇa approximately ended at mean[61] sunrise according to the calendar then in vogue.

145. Now Vyāsa says:—

> ज्वलितार्केंदुनक्षत्रं निर्विशेषदिनक्षयं ।
> अहोरात्रं मया दृष्टं तद्भयाय भविष्यति ॥ २२ ॥[62]

[*Translation.*—"I saw a day on which the constellation of the Sun and the Moon was brilliant and on which the Kshaya (क्षय), *i.e.*, deduction of days was without a remainder. This forebodes evil."]

146. The verse purports to tell that something unusual happened. The constellation of the Sun is always invisible. But the constellation of the Moon is invisible only on an Amāvāsyā day. The visibility of the Moon's constellation is an unusual thing only if this occurs on an Amāvāsyā day. The verse, therefore, must be taken to mean that on an Amāvāsyā day, the constellation of the Moon and of course that of the Sun could be seen. This is clearly the result of the fact already shown that the dimension of the year taken in the *Vedānga-Jyotisha* was not correct.[63]

147. Deduction of days means the deduction to be made from the *Tithis* to find out the number of days they correspond to. To find this, in *Vedānga-Jyotisha*, 62 *Tithis* are taken to be equal to 61 days. It has been shown that in the *Mahābhārata* days this ratio was found to be incorrect and another was adopted. What was the new ratio adopted? To get a deduction that has no remainder the ratio must be expressed by integers. Such a ratio which is more accurate than 61/62, is 63/64 that is 63 days for 64 *Tithis*. It is not possible that the astronomers of those days could have found a more accurate ratio, as in the later *Pitāmaha Siddhānta*

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[61] The *Vedānga-Jyotisha* knew the distinction between true and mean sunrise, as clearly it knew the distinction between true and mean duration of the day. See *Dixit*, p. 90.

[62] *Bhīshma Parva*, Chapter 2.

[63] See *supra*, para. 50.

described in the *Panchasiddhāntikā* of Varāhamihira we find the same ("अवमत्रिषष्ठयाह्नाम्"; see my *Bhāratīya Jyotiḥśāstra Nirīkshaṇa*, page 75). This ratio in the *Yajur-Vedānga-Jyotisha* is 1831/1860 but this would give a deduction without remainder at the end of a Yuga only: while in the statement under consideration it happened some time before the Kārtika Amāvāsyā, the Adhika Māgha being the end of a Yuga. It follows, therefore, that the ratio of days and *Tithis* taken in the *Mahābhārata* days was 63/64. And by this ratio a deduction in *Tithis* without a remainder was obtained at some Amāvāsyā before the beginning of the War.

This conclusion takes us to another important inference namely that the months then began with the bright Paksha. For by this ratio we cannot get a deduction without a remainder on an Amāvāsyā, if the months begin with the dark Paksha, as the formula for finding it then becomes $\frac{30 \times \text{Months} + 15}{64}$, where the divisor being an even number and the number to be divided being an uneven number, we would never get an interger for the quotient. Therefore, the lunar months then began with the bright Paksha as in the *Vedānga-Jyotisha*, for then the formula for finding the deduction becomes $\frac{30 \times \text{Months}}{64}$ which can give an integer.

148. The Kārtika Amāvāsyā was not itself the Amāvāsyā of deduction in the *Tithis* without a remainder (निर्विशेषादिनक्षयम्) for in that case the wording would have been "अहोरात्रं भवत्यद्य" (To-day is the day of deduction in the *Tithis* without a remainder) instead of "अहोरात्रंमयादृष्टं". Now to find such an Amāvāsyā of deduction in *Tithis* without a remainder, we shall get a series of solutions and we ought to accept that solution, which would give the least distance between the Kārtika Amāvāsyā and the Amāvāsyā of deduction in *Tithis* without a remainder; for Vyāsa would not have inferred dark future from such an Amāvāsyā unless it was very near the Kārtika Amāvāsyā.

149. At the time of the War, *Idāvatsara* the third of the five years of the Yuga was going on (see *supra*, paragraph 98, parenthesis). This shows that from the beginning of the system of the *Mahābhārata* Calendar to the beginning of the War some cycles and 35 months had passed. But how many cycles? By taking the ratio between days and *Tithis* to be 63/64, the length of the 62 lunar months of one Yuga becomes 1830·9375 days, while the actual length is 1830·8964 days. Thus there is a mistake of 0·0411 days in one Yuga. As the mistake in *Tithis* amounted to about 2 days or *Tithis*, about 48 Yugas must have passed between the War and the beginning of the system of the calendar in the *Mahābhārata*. But even any number of Yugas more than 25 and less than 66 would give a difference of 2 *Tithis* between the real *Tithi* and that of the calendar.

150. Now we have to find out the number of Yugas that would give a deduction in *Tithis* without a remainder on an Amāvāsyā before the War. The general indeterminate equation that we get is:—

$$\frac{(62\,X + 2a) \times 30}{64} = Y \text{ (here X and Y are integers),}$$

where X is the number of past Yugas and Y, the *Tithi*-Kshayas (deduction in *Tithis*) and where (62 X + 2*a*) represents the number of lunar months from the beginning of the system of the *Mahābhārata* Calendar to the Amāvāsyā of deduction in *Tithis* without a remainder in the year of the War, '*a*' being any integral number. The general solution is this:—

$$\frac{X - a}{16} = S \text{ (here X and S are integers).}$$

151. We get a Kshayamāsa at the end of 19, 25, 31, 38, 44, 50, 57, 63 or 69 Yugas, the total number of Kshayamāsas being 3, 4, 5, 6, 7, 8, 9, 10 or 11 respectively. Again we want to get deduction in *Tithis* without a remainder on the Amāvāsyā of any month before the Kārtika and the Kārtika is the 35th month of the Yuga. Therefore 2 *a* = 35 – Kshayamāsas – D, where D is the number of months between the

described in the *Panchasiddhāntikā* of Varāhamihira we find the same ("अवमविषष्टयाहाम्"; see my *Bhāratīya Jyotiḥśāstra Nirīkshaṇa*, page 75). This ratio in the *Yajur-Vedānga-Jyotisha* is 1831/1860 but this would give a deduction without remainder at the end of a Yuga only: while in the statement under consideration it happened some time before the Kārtika Amāvāsyā, the Adhika Māgha being the end of a Yuga. It follows, therefore, that the ratio of days and *Tithis* taken in the *Mahābhārata* days was 63/64. And by this ratio a deduction in *Tithis* without a remainder was obtained at some Amāvāsyā before the beginning of the War.

This conclusion takes us to another important inference namely that the months then began with the bright Paksha. For by this ratio we cannot get a deduction without a remainder on an Amāvāsyā, if the months begin with the dark Paksha, as the formula for finding it then becomes $\frac{30 \times \text{Months} + 15}{64}$, where the divisor being an even number and the number to be divided being an uneven number, we would never get an interger for the quotient. Therefore, the lunar months then began with the bright Paksha as in the *Vedānga-Jyotisha*, for then the formula for finding the deduction becomes $\frac{30 \times \text{Months}}{64}$ which can give an integer.

148. The Kārtika Amāvāsyā was not itself the Amāvāsyā of deduction in the *Tithis* without a remainder (निर्विशेषदिनक्षयम्) for in that case the wording would have been "अहोरात्रं भवत्यद्य" (To-day is the day of deduction in the *Tithis* without a remainder) instead of "अहोरात्रंमयाद्दष्टं". Now to find such an Amāvāsyā of deduction in *Tithis* without a remainder, we shall get a series of solutions and we ought to accept that solution, which would give the least distance between the Kārtika Amāvāsyā and the Amāvāsyā of deduction in *Tithis* without a remainder ; for Vyāsa would not have inferred dark future from such an Amāvāsyā unless it was very near the Kārtika Amāvāsyā.

152. Of these solutions four are worth consideration.

(1) $a = 13$, $X = 61$ and $D = 0$

(2) $a = 12$, $X = 60$ and $D = 2$

(3) $a = 13$, $X = 45$ and $D = 2$

(4) $a = 14$, $X = 30$ and $D = 3$

The first solution gives us deduction in *Tithis* without a remainder on the Amāvāsyā of the Kārtika. We have shown that this is not what Vyāsa meant and, therefore, this solution is to be rejected. Moreover, the Amāvāsyā of the Kārtika in the year of the War ends towards evening and if there was a deduction in *Tithis* without a remainder at the end of this Amāvāsyā, there would be a complete number of days between the end of this Amāvāsyā and the beginning of the system of the Yugas. This would mean that the system of the Yugas began in the evening. But the Indians never began their day in the evening (see *supra*, para. 143). For this reason also this solution is to be rejected. Any solution in which D is an even number is to be rejected for this reason also. The second solution would not be able to account for the mistake in the beginning of the Uttarāyaṇa that is as large as 24·54 days as shown hereafter.[64] This mistake amounts to 4·7264[65] days in one cycle of 5 years and is corrected by 2·53 days when Kshayamāsa is taken at the end of 19th, 25th, 31st, 38th, 44th, 50th 57th, 63rd, or 69th cycle; so the mistake in 60 cycles and 3 years would be only 17·814 days. Therefore this solution is to be rejected. The third solution is to be rejected for a similar reason. All solutions that are to be rejected for this reason are marked by (*) in the table of solutions given above. All solutions wherein D is less than zero are of course to be rejected. Of the solutions that give positive D, we have to accept that which gives the smallest D. Therefore, the most acceptable solution is the fourth, *i.e.*, $X = 30$ and $D = 3$.

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[64] See *infra*, para. 206.

[65] See *infra*, para. 211.

153. By taking it that the system of the calendar began 30 Yugas and 35 months before the War we get a deduction in the *Tithis* without a remainder on the Śrāvaṇa Amāvāsyā of the year of the War. For, from the beginning to this Amāvāsya, we get (30 × 62 + 32) months and from them four lunar months that must have been omitted at the end of every six or seven Yugas as already shown, must be deducted. Thus we get 1888 months and 56640 *Tithis*. Dividing the *Tithis* by 64, we get the deduction of 885 days and the days of the *Tithis* would be 55755. Therefore, the number of days between the beginning of the system of the Yugas and the Amāvāsyā of the Śrāvaṇa in the year of the War is 55755 exactly. Now we know that the Amāvāsyā of this Śrāvaṇa ended at mean sunrise approximately. Therefore, the system of the Yugas also must have begun at mean sunrise approximately. But we will have to go further and say that the system of the Yugas began at mean sunrise exactly because a beginning of the system at an odd hour is not possible. The discussion in *supra*, paragraph 143, also supports this conclusion. Therefore, we conclude that the system of the Yugas began at mean sunrise 30 Yugas and 35 months before the War and that, therefore, the Amāvāsyā of the Śrāvaṇa in the year of the War ended at mean sunrise.

154. As the Śrāvaṇa Amāvāsyā ends at zero Ghaṭīs, the Āświna Amāvāsyā must end at 3¾ Ghaṭīs and the 13th *Tithi* of the day on which the solar eclipse occurred must end at 5¾ Ghaṭīs. This agrees well with our previous conclusion that the duration of the 13th *Tithi* on that day was zero in the least and 13 Ghaṭīs at the greatest.[66] From this we obtain the result that the Amāvāsyā of the Kārtika on which the War began was $35\frac{40}{64}$ Ghaṭīs by the calendar of those days.

[66] See *supra*, para. 116.

155. Let us now consider the objections to the year and the *Tithi* found out by us, first those to the year and then those to the *Tithi*.

156. The first and the foremost objection to the year is that though it accords with the number of *kings* given in the Purāṇas between the War and Chandragupta Mourya, it does not accord with the number of *years* given in the Purāṇas between the War and Chandragupta Mourya; and that the number of kings given in the Purāṇas is unreliable and the number of years given there is reliable, because the Purāṇas themselves say that important kings only are given by them, in the statement

प्राधान्यतः प्रवक्ष्यामि गदतोमे निबोधत ॥ २९५ ॥[67]

To meet this objection we must examine the Paurāṇika Dynasties carefully. The Dynasties[68] are given below :—

[67] *Vāyu Purāṇa*, Chapter 99.

[68] See *Vāyu Purāṇa*, Chapter 99; *Matsya Purāṇa*, Chapters 270–73; *Vishṇu Purāṇa*, Anśa 4th, Chapters 23/24; and *Bhāgavata Purāṇa*, Skandha 9, Chapter 22 and Skandha 12, Chapters 1/2.

The Kings of the Bārhadratha Line

List A Years	*Vishṇu Purāṇa* Name of King	*Bhāgavata Purāṇa* Name of King	*Vāyu Purāṇa* Name of King	*Vāyu Purāṇa* Years	*Matsya Purāṇa* Name of King	*Matsya Purāṇa* Years
58	(1) Somāpi	Mārjāri	Somādhi	58	Somādhi	58
64	(2) Śrutaśravas	Śrutaśravas	Śrutaśravas	64	Śrutaśravas	64
36	(3) Ayutāyus	Ayutāyus	Ayutāyus	26	Apratīpī	36
100	(4) Nirāmitra	Niramitra	Niramitra	100	Niramitra	40
56	(5) Sukshatra	Sunakshatra	Sukṛitta	56	Suraksha	56
23	(6) Bṛihatkarmā	Bṛihatsena	Bṛihatkarmā	23	Bṛihatkarmā	23
50	(7) Senajit	Karmajit	Senajit	..	Senajit	50
40	(8) Śrutanjaya	Śṛitanjaya	Śrutanjaya	40	Śrutanjaya	40
93	{ (9) Vipra	Vipra	..	35	Vibhu	28
	{ (10) Śuchi	Śuchi	Śuchi	58	Śuchi	58 + 6
28	(11) Kshemya	Kshema	Kshema	28	Kshema	28
64	(12) Suvrata	Suvrata	Bhuvata	64	Anuvrata	64
35	(13) Dharma	Dharmasūtra	Dharmānetra	5	Sunetra	35

The Kings of the Bārhadratha Line (Contd.)

List A Years	*Vishṇu Purāṇa* Name of King	*Bhāgavata Purāṇa* Name of King	*Vāyu Purāṇa* Name of King	*Vāyu Purāṇa* Years	*Matsya Purāṇa* Name of King	*Matsya Purāṇa* Years
58	(14) Suśrama	Śama	..	58	Nivṛiti	58
38	(15) ..	..	Suvrata	38	Trinetra	28
58	(16) Dṛiḍhasena	Dyumatsena	Dṛiḍhasena	58	Dyumatsena	48
33	(17) Sumati	Sumati	Sumati	33	Mahīnetra	33
32	(18) Subala	Sumala	Suchala	22	Achala	32
40	(19) Sunīta	Sunītha	Suchala	40	..	..
83	(20) Satyajit	Satyajit	Satyajit	83	..	..
53	(21) Viśvajit	Viśvajit	Wīrajit	53	..	..
50	(22) Ripunjaya	Ripunjaya	Arinjaya	50	Ripunjaya	50
TOTAL 1092	Total of years (as given by the *Purāṇa*) 1,000 Number of Kings (as given by the *Puraṇa*) 21	Total of years (as given by the *Purāṇa*) 1,000	Total of years (as given by the *Purāṇa*) 1,000 Number of Kings (as given by the *Purāṇa*) 32 from Bṛihadratha		Total of years (as given by the *Purāna*) 1,000 Number of Kings (as given by the *Purāṇa*) 32 from Bṛihadratha	

Kings of the Pradyotana Line

Vishṇu Purāṇa	*Bhāgavata Purāṇa*	*Vāyu Purāṇa*		*Matsya Purāṇa*	
Name of King	Name of King	Name of King	Years	Name of King	Years
(1) Pradyota	Pradyota	Pradyota	23	Son of Pulaka	23
(2) Pālaka	Pālaka	Pālaka	24	Pālaka	28
(3) Viśākhayūpa	Viśākhayūpa	Viśākhayūpa	50	Viśākhayūpa	53
(4) Janaka	Rājaka	Ajaka	31	Sūryaka	21
(5) Nandivardhana	Nandivardhana	Nandivardhana	20	Nandivardhana	30
Total number of years (as given by the *Purāṇas*) 138	Total number of years (as given by the *Purāṇa*) 138	Total number of years (as given by the *Purāṇa*) 138		Incomplete in Calcutta Edition. Bombay Edition gives the total of 52 years for all five Kings.	

Kings of the Śaiśunāga Line

Vishṇu Purāṇa Name of King	Bhāgavata Purāṇa Name of King	Vāyu Purāṇa		Matsya Purāṇa	
		Name of King	Years	Name of King	Years
(1) Śiśunāga	Śiśunāga	Śiśunāga	40	Śiśunāga	40
(2) Kākavarṇa	Kākavarṇa	Śakavarṇa	36	Kākavarṇa	36
(3) Kshemavarmā	Kshemavarmā	Kshemavarmā	20	Kshemadhāmā	36
(4) Kshatraujas	Kshetrajña	Ajātaśatru	25	Kshemajit	24
(5) Bindusāra	Vidhisāra	Kshatraujas	40	Vindhyasena	28
..	..	..	..	Kānvāyana	9
..	..	..	..	Bhūmimitra	14
(6) Ajātaśatru	Ajātaśatru	Vivisāra	28	Ajātaśatru	27
(7) Darbhaka	Darbhaka	Darśaka	25	Vanśaka	24
(8) Udayana	Ajaya	Udayī	33	Udāsī	33
(9) Nandivardhana	Nandivardhana	Nandivardhana*	40	Nandivardhana	40
(10) Mahānandī	Mahānandī	Mahānandī	43	Mahānandī	43
Total number of years (as given by the *Purāṇa*) 362	Total number of years as given by the *Purāṇa*) 360	Total number of years (as given by the *Purāṇa*) 362		Total number of years as given by the *Purāṇa*) 360	

* The reading in the text gives 42 years, but the reading is incorrect for there are nine letters in the Pāda of the verse. So, we have to read " चत्वारिंशत् " for " द्वाचत्वारिंशत् ".

157. The Purāṇas all agree in saying that after the Śaiśunāga kings, the Nandas ruled for 100 years, the Mauryas for 137 years, the Śungas for 112 years, and the Kaṇvas for 45 years. The Āndhras, the last of whom is Puloman, then ruled for 456 years according to the *Vishṇu Purāṇa* and the *Bhāgavata Purāṇa* and 460 years according to the *Vāyu Purāṇa* that gives an incomplete list.

158. Now the objectors find the date of the War in this way:—

1000	years for	Bārhadratha	Kings
138	,,	Pradyotana	,,
362	,,	Śaiśunāga	,,
100	,,	Nanda	,,
322	B.C. the date of the accession of Chandragupta Mourya		
1922	B.C. or minus 2420 by our way of giving time.		

These objectors have not, however, carefully examined the dynasties in the Purāṇas, as we will show below.

159. According to the Purāṇas the ten Śaiśunāga kings ruled for 362 years. This gives an average of 36 years for one king. The five Pradyotana kings ruled for 138 years; this gives an average of 27·6 years for one king. The twenty-two kings of the Bārhadratha line ruled for 1000 years and this gives an average of 45·5 years for one king. It is a historical fact that the average for one king of any line does not exceed 25 years and this is explained by the fact that a man generally gets a son at the age of 25 or even before that. These large averages therefore, need an explanation.

160. The objectors say that some kings are omitted from the lists though the years of their rule are included in the total years given. This is untenable. For, the Purāṇas give the years of each king separately and the separate years alone almost make up or even at times exceed the total they have given and leave very little or no room for the years of

the unnamed kings. The statement "प्राधान्यतः प्रवक्ष्यामि" really means that only those that became kings are mentioned in the dynasties and not that some kings in the dynasties are omitted. In historical works moreover, such omissions would also be quite unreasonable and unhistorical and should not be supposed to have been resorted to by the Purāṇas. Moreover, the averages obtained from the addition of the separate years of the named kings are also excessive, even at times almost double of what they ought to be. How can this be explained? It cannot be explained unless we suppose that the Purāṇas omitted each alternate king and included his years in those of his successor or predecessor. But this supposition is quite absurd.

161. Moreover, the Purāṇas also give the total number of years from the birth of Parikshit, *i.e.*, from the Bhārata War to the crowning of *Mahāpadma*, the first of the Nanda Kings and from his crowning to the end of the reign of Puloman, in the following verses and these conflict with the totals of the dynasties given separately. I will therefore, discuss these verses in detail.

162. (*a*)

आरभ्य भवतो जन्म यावन्नंदाभिषेचनं।
एतद्वर्षसहस्रं तु शतं पंचदशोत्तरम् ॥ २६ ॥

तेनैत ऋषयो युक्तास्तिष्ठंत्यब्दशतं नृणाम् ।
ते त्वदीये द्विजाः काले अधुना चाश्रिता मघाः ॥ २८ ॥

यदा मघाभ्यो यास्यंति पूर्वाषाढां महर्षयः ।
तदा नंदात्प्रभृत्येष कलिर्वृद्धिं गमिष्यति ॥ ३२ ॥[60]

[*Translation.*—" One thousand and one hundred and fifteen (1115) years will pass from your (Parikshit's) birth to the coronation of Nanda. The seven Ṛishis, *i.e.*, the stars in the Great Bear, stand conjoined with one constellation for one hundred years of men. They are at present in your time in the constellation Maghā. When the seven great Ṛishis

• *Bhāgavata Purāṇa* Skandha 12, Chapter 2.

will go from the Maghā to the Pūrvāshāḍhā then, *i.e.*, from the time of the Nandas, the Kali will grow in strength."]

We have similar verses in the *Vishṇu Purāṇa* in 24th Chapter, 4th Anśa, where for 'शतं' we have the reading 'ज्ञेयं' (see verses 104 to 112) and for पंचदशोत्तरं we have पंचाशदुत्तरम्.

Some persons have translated this 26th verse as,

"One thousand five hundrd and ten years will pass ....etc." But it is clear that this is not the meaning of the author of the *Bhāgavata*. For, in the 32nd verse the same period is given in terms of the constellations traversed by the Ṛishis. The Ṛishis were supposed to be in the Maghā at the time of Parikshit and they were supposed to take hundred years to traverse one constellation as stated here. This is also well known (see *Dixit*, page 373). Thus to go from the Maghā to the Pūrvāshāḍhā they cannot take more than 1100 years. We cannot, therefore, accept the meaning that 1510 years passed between the birth of Parikshit and the coronation of Nanda. This is supported by the reading in the *Vishṇu Purāṇa*. Moreover, such a construction would require the wording to be 'शतानि पंच' which is not the case here.

163. (*b*) The following passage from the *Mastya Purāṇa* is also very clear and unambiguous :—

महापद्माभिषेकात्तु यावज्जन्मपरिक्षितः ।
एतद्वर्षसहस्रं तु ज्ञेयं पंचाशदुत्तरं ॥ ३५ ॥
पौलोमस्तु तथांध्रास्तु महापद्मांतरे पुनः ।
तदंतरं शतान्यष्टौ षट् त्रिंशच्च समाः स्मृताः ॥ ३६ ॥
तावत्कालांतरं भाव्यं आध्रांतादापरिक्षितः ।
भविष्ये ते प्रसंख्याताः पुराणज्ञैः श्रुतर्षिभिः ॥ ३७ ॥ [70, 71]

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[70] *Matsya Purāṇa*, Chapter 273.

[71] There is a similar passage in the *Vāyu Purāṇa*, Chapter 99. We have given above the reading from the Calcutta Edition. The Bombay Edition does not differ in any material point from this reading.

Mr. Karandikar, the learned editor of the *Kesarī*, however, says that in some copies of the *Vāyu Purāṇa*, the reading is पंचशत (meaning five

[*Translation.*—"From the birth of Parikshit to the crowning of महापद्म (Mahāpadma) (the first of the Nanda line) the period amounts to 1050 years. So also the period between Mahāpadma and Pouloman, the last of the Āndhras, amounts to 836 years. This is the period between the end of the Āndhras and Parikshit, *i.e.*, 1886 years. These years have been told by Ṛishis learned in the Purāṇas in the portion of the Purāṇas dealing with the future."]

164. Do these periods agree with the totals given for each dynasty? The following calculation will show it:—

1000	Bārhadratha	Kings
138	Pradyotana	,,
362	Śaiśunāga	,,
100	Nanda	,,
137	Maurya	,,
112	Śunga	,,
45	Kaṇva	,,
456	Āndhra	,,
2350	Total according to the dynasties.	

hundred) instead of पंचाशद् and that this reading is proved to be the correct one by the verse

"सप्तर्षयो मघायुक्ताः काले पारिक्षितेऽभवन् ।
आंध्रांते ते चतुर्विंशे भविष्यंति मते मम" ॥

that follows the three verses we are discussing (see "*Kesarī*," 13th December 1938). But the words मते मम meaning in "my opinion", imply that there was another opinion also. Moreover the reading पंचशत and its interpretation by Mr. Karandikar cannot be taken in the corresponding verses in the *Vishṇu* and the *Bhāgavata Purāṇas* for the reason already given in paragraph 162अ. It, therefore, appears that the reading पंचशत is the result of a correction made in modern times for removing inconsistencies in the Purāṇas; this reading cannot, therefore, be accepted. Even if it be accepted and construed to mean five hundred, there arises a conflict between the *Vāyu Purāṇa* on the one side and the *Vishṇu* and the *Bhāgavata Purāṇas*, on the other. Mr. Karandikar has not explained away this conflict. Therefore the date of the Mahabhārata War based upon this reading and its interpretation by Mr. Karandikar cannot be accepted as correct, especially as the reading can be interpreted to mean one hundred and five also. Even if we interpret पंचशत to mean one hundred and five, we cannot accept that reading, because it cannot be reconciled with other statements in the Purāṇas.

But according to the statement under discussion the same period amounts to 1050 plus 836, *i.e.*, 1886.

165. There is a difference of about 500 years between these two calculations and this is about half of the period of the Bārhadratha Kings. This is suggestive. Did the author of this statement in the *Matsya Purāṇa* and the authors of similar statements in the *Vishṇu Purāṇa*, the *Bhāgavata* and the *Vāyu Purāṇas* know that the real period of the Bārhadratha kings was half of what is stated in the dynasties in the Purāṇas.

166. To decide this we should calculate the real period of the Bārhadratha Kings. In the lists given above there is some difference between the *Matsya Purāṇa*, and the *Vāyu Purāṇa* about the years of some kings. Let us take the larger number where there is a difference. But in the case of the two contiguous Kings Vibhu and Śuchi, we know that according to the *Matsya* they together ruled for 92 years and according to the *Vāyu* they ruled for 93 years. Therefore let us take 93 years for both together. In this way we get the list shown as the list *A* above and we get the maximum period for which the Bārhadratha Kings may have reigned; half of it is 546. Taking this to be real period of the Bārhadratha Kings we get the following calculation:—

546	Bārhadratha	Kings
138	Pradyotana	,,
362	Śaiśunāga	,,
100	Nanda	,,
137	Maurya	,,
112	Śunga	,,
45	Kaṇva	,,
456	Āndhra	,,
1896	Total.	

This differs from the years given by the *Matsya* by only ten years. If, however, in the list *A* we take the years of Ayutāyus and Suchala to be 26 and 22 as told by the *Vāyu Purāṇa*, the addition of the years of all the Bārhadratha

Kings will be 1072 and half of it will be 536. If now we take the period of the Bārhadratha Kings to be 536 years instead of 546 years in the calculation just made we get the figure of the *Matsya Purāṇa*.[72] Does this not show that the author of these verses in the *Matsya Purāṇa* knew that the real years of the Bārhadratha Kings were 536, that is, half of what were told in the dynasties? This is what the excessive average of the periods of their reigns also suggests.

167. Apply this same principle to the Pradyotana and the Śaiśunāga Kings; for their averages also are large. We then get the following calculation for the date of the Bhārata War.

536	Bārhadratha Kings
69	Pradyotana ,,
180	Śaiśunāga ,,
100	Nanda ,,
312	B.C. the date of the coronation of Chandragupta Mourya.
78·3	the period between the beginnings of the Christian Era and the Śaka Era.
420	The Śaka year which we have taken as Zero-date, *i.e.*, the years from the beginning of the Śaka Era to our Zero-date.
1695·3	Total.

[72] *Note.*—It may be objected that the *Matsya Purāṇa* gives the period from Parikśhit's birth to Pouloman's end, in two parts and that these parts do not agree with our calculation. According to our calculation the first part from Parikshit's birth to the beginning of the Nandas would be 1036 years and the second part is equal to 850 years while the *Matsya Purāṇa* gives the two parts as 1050 and 836 years. Our two parts are together equal to the two of the *Matsya Purāṇa* taken together but our first is less by 14 and our other part greater by 14 than the corresponding parts of the *Matsya*. This only proves that a doubtful period of 14 years passed between the beginning of the reign of Mahāpadma and his coronation and it may be that this period of 14 years represents the period of conflict between Śiśunāga, given in the list from *Mahāvanso* just hereafter and Mahāpadma, the first of the Nanda Kings, before the latter's coronation. Some included this period of 14 years in the reign of the Nandas and some in that of the Śiśunāgas and therefore the difference between different statements came into existence.

Thus we get the very year we got from the astronomical data.

168. Objections may be raised against this calculation (1) that the date of Chandragupta's coronation is 322 B.C. and not 312 B.C. and (2) that the periods of the Bārhadratha, the Pradyotana and the Śaiśunāga Kings only have been halved and not of the others, *i.e.*, of the Nandas. To answer these we refer the reader to the following lists from the *Mahāvanso*, Chapters II, IV and V, and the Purāṇas respectively.

Kings	Years in *Mahāvanso*		Kings	Years in Purāṇas
1. Ajātaśatru ..	32			
2. Udayī-bhadraka ..	16		Udayī	
3. Aniruddha and Munda	8		Nandivardhana	33
4. Nagadāsaka ..	24		Mahānandī	40
5. Śiśunāga	18			43
6. Kālāśoka	28			
7. Nandas (ten) ..	22			
8. „ (nine) ..	22	124	Nandas (nine)	100
9. Chandragupta ..	34		Chandragupta	24
10. Bindusāra	28			
11. Aśoka	37			

169. The lists show that to make up the hundred years of the Nandas mentioned by the Purāṇas, we have to include 18 years of Śiśunāga and also the first ten years of Chandragupta. This shows that the Purāṇas did not include the first ten years of Chandragupta's reign in his reign but in that of the Nandas and that there was a period of ten years (of conflict) that was doubtful, some including it in the reign of the Nandas and some in that of Chandragupta and that Chandragupta reigned for 34 years altogether. Now Chandragupta became King in 322 B.C. undoubtedly; but

the first ten years of his reign having been included by the Purāṇas in the 100 years of the Nandas, we have to take 312 B.C. as the beginning of his reign if we take 100 years as the period of the Nandas.

This is what we have done. Had we taken 322 B.C. as date of his coronation we would have been required to take 90 years only as the period of the Nandas and the result would have been the same.

170. In verse 21, Chapter V of the *Mahāvanso* it is stated that 218 years passed between the coronation of Aśoka and the Nirvāṇa of Buddha. In verse 32 of Chapter II it is stated that the Buddha's Nirvāṇa took place in the 8th year (अट्ठमे) of Ajātaśatru's reign and that Ajātaśatru reigned for 24 years after Nirvāṇa. We do not get 218 years between the Nirvāṇa and Aśoka's coronation unless we suppose that Ajātaśatru reigned for 16 years altogether, *i.e.*, ½ of his years of reign stated by *Mahāvanso* and unless the reign of Aniruddha and Munda is taken to be of 18 years. For, in that case, we get the period in this way :—

8	years from the Nirvāṇa to the end of Ajātaśatru's reign.
16	Udayībhadraka.
18	Aniruddha and Munda.
24	Nagadāsaka.
18	Śiśunāga.
28	Kālāśoka.
22	Nandas (Ten).
22	Nandas (Nine).
34	Chandragupta.
28	Bindusāra.
218	Total (years).

Therefore we may safely say that the real period of Ajātaśatru's reign is 16 years and that of Aniruddha and Munda is 18 years.

171. The period of 124 years of the Nandas and Chandragupta given by the Purāṇas corresponds exactly with 124 years of the *Mahāvanso* from the beginning of Śiśunāga to the end of Chandragupta. But corresponding to the 116 years of Udayī, Nandivardhana and Mahānandī given by the Purāṇas, we have 58 years of Udayībhadraka, Aniruddha and Munda and Nagadāsaka, *i.e.*, exactly half of the former, the years of Aniruddha and Munda being really 18 as shown above, though stated to be eight. The years of Udayī in the *Mahāvanso* are almost half of those in the Purāṇas and as shown above the years of Ajātaśatru are really half of what are stated in the *Mahāvanso*. We, therefore, infer that the years as given in the Purāṇas up to the end of the Śaiśunāgas are double of the actual years but that the years of the Nandas are not so doubled.

172. We have thus proved that the years in the Purāṇas are sometimes double of the real years and that when halved they give the same year for the Bhārata War as the astronomical data do.

173. But we may be asked why the Purāṇas doubled the real years. The explanation is that the authors of the Purāṇas did not in fact intentionally double the actual years of the reigns of Kings but the words Samāḥ (समाः) and Varsha (वर्ष) as commonly understood in those days also meant half a year and they only gave numbers of half-year, to indicate the periods of reigns of Kings, as the words Samāh (समाः) and Varsha (वर्ष) in those days meant half a year also.

174. The word Sama (सम) originally means equal and it can be taken to mean one of the two equal parts of a year. It was therefore first used as equivalent to half a year and then equivalent to the whole year. This is the only way by which we can explain how a word originally meaning 'equal' came to mean a year. Besides, both the words Samāḥ and Varsha seem to be equivalent to half a year in the passage:—

उषित्वा द्वादशसमा इक्ष्वाकूणां निवेशने ।
ततस्त्रयोदशे वर्षे राजाऽऽमंत्रयत प्रभुः ॥ ५ ॥
मम भर्ता महातेजा वयसा पंचविंशकः ॥ १० ॥[73]

[*Translation.*—" After I had lived in the house of the Ikshwākus for twelve Samāḥ, *i.e.*, in the thirtenth Varsha of my residence in the house of the Ikshwākus, the King Daśaratha took counsel (about the installation of Śree Rāma as a Yuvarāja).....My husband was then of twenty-five years of age."]

Here Sītā says that after she had lived twelve Samāḥ or Varshas in the house of the Ikshwākus her husband became 25 years old, *i.e.*, twelve Samāḥ or Varshas after her marriage her husband became 25 years old. If we understand Samāḥ or Varsha to mean one complete year Śree Rāma's age at the time of his marriage would be only thirteen. This is not the age at which men were married in ancient times. This age is also too small for the exploits Śree Rāma is said to have performed before marriage. This age does not also accord with the story in the *Rāmāyaṇa* where in the last chapter of *Bālakāṇḍa*, Sītā is described as cohabiting with Śree Rāma immediately after marriage (रेमिरे मुदितारहः) ॥ १७ ॥ On the other hand if we understand the words Samāḥ (समाः) and Varsha (वर्ष) to mean half a year, Śree Ramā's age at the time of marriage would be 19 and this agrees very well with all the stories in the *Rāmāyaṇa*. Though the passage " रेमिरे मुदितारहः " forms part of an interpolation it shows without doubt what the interpolater understood by the words Samāḥ (समाः) and Varsha (वर्ष) in the passage under consideration.

175. In

पार्थः पंच च षष्टिं च वर्षाणि श्वेतवाहनः ।
महावीर्यं महादिव्यं एतद् धनुरधारयत् ॥ ७ ॥[74]

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[73] *Rāmāyaṇa, Araṇyakāṇḍa*, Sarga 47.
[74] *Virāṭa Parva*, Chapter 43.

Parth (Arjuna) is said to have possessed the great bow of the Prajāpati for 65 Varshas, of course, from the time he got it, *i.e.*, from the burning of the Khāṇḍava forest to the end of the exile, as the context would show. Here the commentator Nīlkaṇṭha construes .Varsha (वर्ष) to mean half a year. He says "पार्थः पंच च षष्टिंचेत्यत्र तु वर्षशद्बो वृष्टिपरः । तथा च संवत्सरे वर्षद्वयं जायते । तथाहि 'एकेन वर्षेण तृप्तः शरदि व्रीह्याग्रायणं करोति अपरेण तृप्तो वसंते यवाग्रायणं करोति' "।[75]

Here Nīlkaṇṭha has given a quotation in which *Varsha* means 'rains' and thus ultimately half a year. Nīlkaṇṭha is not cited here to show that in this passage in the *Mahābhārata* Varsha (वर्ष) really means half a year, but only to show that Varsha (वर्ष) can have that meaning. If in the passage of the *Mahābhārata* given above we take Varsha (वर्ष) to mean one complete year, Abhimanyu, who was born when the forest was burned, would be 65 years old at the time of the War and if we take Varsha (वर्ष) to mean half a year he would be 32½ years old at the time of the War. This does not agree with the description that he was *Śiśu* at the time of the War.[76] Therefore we have to take it that the period sixty-five *Varshas* is counted from the burning of the forest to the end of Arjuna's life. Arjuna lived 22 years after the War as the eclipses prove and we can suppose that 21½[77] years passed between the burning of the forest and the War. In making the number 65 the latter period appears to have been doubled before it is added to the former [$22 + (2 \times 21\frac{1}{2}) = 65$]. This mistake might have happened in this way. The latter period may have been stated somewhere as 43 and being misunderstood as meaning 43 years it was added to 22 years of the

[75] *Translation.*—" In this passage namely, पार्थः पंच च &c., etc., the word Varsha is equivalent to a rainy season. There are two rainy seasons in one year. It is therefore said "Being gratified by one rainy season, he (man) performs *Āgrāyaṇa* by rice and being gratified by another rainy season he (man) performs *Āgrāyaṇa* by barley."

[76] See *supra*, para. 107.

[77] This is proved to be a fact in *infra*, para. 403.

former period. This is the explanation of 65 and no better explanation suggests itself. This also shows that years were at times given doubled in those days.

176. In *Rājataranginī* the history of Kāśmīra by Kalhaṇa, twenty-kings from third Gonanda to Narendrāditya are given with the years of each separately. The addition comes to 967¾ and gives an average of 48 which is almost double of what is possible. This also shows that those years are double of the real ones and that Varsha (वर्ष) and Samāḥ (समाः) meant half a year in the days when the years of the kings in the Purāṇas were first recorded. Words change their meanings. The word ज्या for instance has a similar history in Mathematics. It first meant a full chord of an angle. It has now come to mean half the chord of double the angle.[78] We can, therefore, conclude that Samāḥ (समाः) and Varsha (वर्ष) formerly meant half a year and it is therefore that the periods of the Bārhadratha. the Pradyotana, and the Śaiśunāga Kings given in the Purāṇas are expressed in half-years.

177. Another objection may also be raised against our calculation of the date of the War from the statements in the Purāṇas. The objector would say that the statements in the Purāṇas are inconsistent with one another, that we have selected and used only those that are favourable to us, that we have in the case of the Kings of the Bṛihadratha line, used the sum of the separate reigns of the Kings, but in the case of the Pradyotana and the Śaiśunāga Kings, we have used the totals given by the Purāṇas.

178. The reply is that the inconsistencies can be removed by the methods suggested in the First Lecture and that after the removal of the inconsistencies we get the data that we have used above for calculations. Small differences in names and omissions of some Kings in one Purāṇa or the other

[78] See verses 38-45 of *Vaśishṭha Siddhānta*, where ज्या and ज्यार्ध have been used as synonyms.

can be explained by asssuming corruptions of the text by mis-readings. When a name of a King in one Purāṇa differs absolutely from that in another, that may be due to the fact that the king had several names, but he can be identified in most cases by the years of his reign being the same in different Purāṇas and by his order in the list. For instance, Somādhi and Mārjāri can be identified with each other.

179. Many inconsistencies can also be removed by reading विंशति and विंशत् for त्रिंशति and त्रिंशत् and *vice versa*. For, त्रि and वि can be easily mis-read for each other and authors of the Purāṇas used, it appears, विंशत् for विंशति and त्रिंशति for त्रिंशत् without caring for grammar. In the Pradyotana line the years of Ajaka are stated by the *Vāyu Purāna* by the words " एकत्रिंशत्समाराज्यं अजकस्य भविष्यति " (Chapter 99, verse 313); but the *Matsya* says, " एकविंशत्समा राजा सूर्यकस्तु भविष्यति " (Chapter 272, verse 4). Here, if we read एकविंशत् in the *Vāyu Purāṇa* as we actually have in the *Matsya Purāṇa*, the sum of the reigns of all Pradyotana Kings comes to 138 as given in the total in all Purāṇas except the *Matsya*. If we can thus remove the inconsistency between the years of the separate reigns of kings and a total of years for the dynasty as a whole given by the Purāṇas, we must accept that total as the correct one and reject any other total. Here in the case of the Pradyotana Kings we have followed this principle in accepting the total of 138 years and in rejecting the total of 52 years given by the *Matsya Purāṇa*, which clearly appears to be a result of some misreading and is inconsistent with the years of the reigns of the kings separately given.

180. In the case of the Śaiśunāga Kings some Purāṇas say that the total of years for the Dynasty is 362 and others say that it is 360. The sum of their separate reigns in the *Vāyu Purāṇa* is 330; but if we read पंचत्रिंशत् for पंचविंशत् in the verse about Ajātaśatru, अष्टात्रिंशत् for अष्टाविंशत् in the verse about Vivisāra and take the reading पंचत्रिंशत् in the verse about Darśaka as available in one MSS. we get for the

Dynasty the sum of 360 years as stated in some Purāṇas. In the *Matsya Purāna* the two kings Kaṇvāyana and Bhūmimitra have certainly come in by mistake in the list of the Śaiśunāga Kings, for they are given again in the same Purāṇa by the same words amongst the Kaṇva Kings. Omitting these two, the sum of the separate years of the other Śaiśunāga Kings is 331; but if we substitute in the *Matsya Purāṇa* the readings just suggested for the *Vāyu Purāṇa*, we get the total of 361. But that does not agree with any total given by the Purāṇas, even with the total given by the *Matsya Purāṇa* itself. We should, therefore, infer some mistake in the readings of the years of separate reigns in the *Matsya Purāṇa*. Thus we can conclude that the total of years for the Kings of the Śaiśunāga line was 360.

181. We have already seen that the sum of the half-years of the separate reigns of the Bārhadratha Kings was taken to be 1072 by the authors of the statements (*a*) and (*b*).[79] The statements in the Purāṇas that they ruled for one thousand years, (really half-years), must be a statement of an approximate and round number and cannot be said to conflict with the sum of the years given separately for each king. The inference, therefore, that the Bārhadratha Kings ruled for 1072 half-years is legitimate.

182. It should be noted that though the *Matsya* and the *Vāyu Purāṇas* say that there were 32 Kings in the Bārhadratha line, there is no inconsistency for the number 32 includes the ten Kings from Bṛihadratha to Sahadeva[80] and the reading in the verse " द्वात्रिंशच्च नृपाह्येते भवितारो बृहद्रथात् "[81] means the same.

183. Thus we have removed all the inconsistencies in the statements in the Purāṇas and got the data we have used for calculating the date of the War.

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[79] See *supra*, paragraphs 162 and 163.
[80] See *Vāyu Purāṇa*, Chapter 99, verses 221–88.
[81] *Vāyu Purāṇa* Chapter 99, verse 308.

184. Similar to the objection we are discussing is another, based upon the following statement of Garga

आसन् मघासु मुनयः शासति पृथिवीं युधिष्ठिरे नृपतौ ।
षड्द्विकपंचद्वियुतः शककालस्तस्य राज्यस्य ॥[82]

[*Translation*.—" The Saptarshis were in the Maghā when Yudhishṭhira was ruling. His Era is equal to the Śaka Era plus 2566 years. "]

185. " षड्द्विक " really means two sixes, but Kalhaṇa the author of the *Rājataranginī* has taken it to mean 26, *i.e.*, he takes द्विक equivalent to द्वि while grammatically it really means a group of two things. Here, therefore, षड्द्विक really means a group of two sixes, *i.e.*, 66 but as Kalhaṇa has taken the meaning 26 in his *Rājataranginī* we shall for the purpose of showing his absurdities adopt the meaning ' 26 '. Moreover our arguments, will apply to any of the said meanings.

186. The objection is that this statement proves the date of Yudhishṭhira to be 2566 or 2526 before the Śaka Era or 2488 or 2448 B.C. and that this is opposed to the conclusion that the Mahābhārata War was fought in 1197 B.C. We shall discuss this objection here.

187. This statement gives a result different from that given by the statements in the Purāṇas and both as they are, give results different from the result obtained from the astronomical statements in the *Mahābhārata*. These astronomical statements come from those who actually made the observations and are primary evidence; while the statements of the Purāṇas and of Garga are obviously secondary evidence. We have to reject the secondary evidence, where it conflicts with the primary evidence; for the conflict shows that there must be some mistake in the statements constituting secondary evidence although we may not be able to find out what

[82] *Note*.—Quoted by Kalhaṇa in the *Rājataranginī*, Chapter I, verse 56. The original *Garga Samhita* is not available.

that mistake may be as we did in the case of the statements in the Purāṇas. It is true that we cannot find out the exact mistake in this statement of Garga but we shall see to what absurdities Kalhaṇa was led in accepting it as correct.

188. Kalhaṇa says that Gonanda, the first King of Kāśmīra, was the contemporary of the Pāṇḍava Yudhishṭhira, that 52 kings beginning with this first Gonanda have been forgotten, that these 52 kings ruled for 1266 years

(वर्षाणां द्वादशशती षष्टिः षड्भिश्च संयुता ।
भूभुजां कालसंख्यायां तद्द्वापंचाशतो मता ॥[83])

that these 52 kings consist of 4 kings from the first to the second Gonanda, of 35 forgotten kings, of eight kings beginning with Lava, of Aśoka, of Jalauka, of Dāmodara, of the joint kings Hushka and Jushka and Kanishka, and of Abhimanyu; that twenty-one kings beginning with the third Gonanda and ending in Andha-Yudhishṭhira then ruled in Kaśmīra for 1014¾ years, that about 2330 years passed between the third Gonanda and Kalhaṇa (1070 Śaka Era)

(प्रायस्तृतीयगोनंदादारभ्य शरदां पुनः ।
द्वे सहस्रे गते त्रिंशदधिकं च शतत्रयम् ॥ ५३ ॥[84])

and that Raṇāditya ruled for 300 years.[85]

189. The absurdities are (1) that Raṇāditya ruled for 300 years; (2) that 21 kings from Gonanda to Andha-Yudhishṭhira ruled for 1014¾ years, *i.e.*, almost double of what is really possible; and (3) that the dates of Aśoka and Kanishka are earlier than 2330–1070, *i.e.*, 1260 before the Śaka Era. Now we know for certain that Kanishka ruled at about the beginning of the Śaka Era and that Aśoka ruled 338 years before the Śaka Era. It is, therefore, clear that Kalhaṇa has made a mistake of about 1260 years and that there is a

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[83] *Rājataranginī*, Chapter I, verse 54.
[84] *Ibid.*, Chapter I, verse 53.
[85] *Ibid.*, 3rd Taranga, verse 470.

mistake of about 1260 years in Garga's date of the Pāṇḍavas. This shows that the real date of the Pāṇḍavas or of the first Gonanda is about (2526–1260), *i.e.*, 1266 before the Śaka Era. This is also confirmed by the traditional statement given by Kalhaṇa that the first 52 kings, of whom Gonanda, the contemporary of the Pāṇḍavas, is the first and Kanishka, who ruled at about the beginning of the Śaka Era is the last but one, ruled for 1266 years. Thus from the examination of *Rājataranginī* also, we clearly come to the conclusion that the real date of the first Gonanda and the Pāṇḍavas is about 1266 years before the Śaka Era. This is only nine years later than the date of the Mahābhārata War, as determined by us from the astronomical statements.

190. If the real date of the Pāṇḍavas was about 1266 before the Śaka Era and Kalhaṇa took it to be 2526, how was the gap of 1260 years filled up? Of course mainly by supposing that Raṇāditya ruled for 300 years (त्रिशतं) though really he may have ruled for only त्रिंशतं[86] (thirty) and by making the forgotten kings from the third Gonanda to Andha-Yudhishṭhira rule for 1014¾ years after the first 52 kings, though they were really included in those 52 forgotten kings. Thus he filled the gap by 270 + 1014¾, *i.e.*, 1284¾ years. Now if we calculate the date of the Pāṇḍavas from the years of the reigns of all the kings, as given by Kalhaṇa, we get it

[86] *Note.*—That Raṇāditya ruled for thirty years only, is confirmed by the following considerations: (1) Firstly, त्रिशतं can be mis-read for त्रिंशतं and Kalhaṇa appears to have adopted the reading त्रिशतं in works available to him because it suited his date of the Pāṇḍavas. (2) Secondly, if we accept that Raṇāditya ruled only for thirty years, we get by calculation that Mātṛigupta abandoned the throne of Kāśmīra in the year 297 of the Śaka Era. This is the well-known date of Samudragupta's death. Kalhaṇa also tells us that Mātṛigupta abandoned the throne immediately after hearing the death of Vikramāditya (विक्रमादित्य) who had placed him on the throne (Chapter III, verse 287). This shows that the king, who placed Mātṛigupta (मातृगुप्त) on the throne of Kāśmīra was Samudragupta and that Raṇāditya really ruled for thirty years.

to be 2544¾[87] years before the Śaka Era. Therefore the real date of the Pāṇḍavas is 2544¾ minus 1284¾, *i.e.*, 1260 before the Śaka Era. Had we known the small period during which Harsha and others appear to have ruled before Pratāpāditya,[88] we would get a slightly earlier date. Thus even the evidence of the *Rājataranginī*, if properly sifted, only serves to confirm the date that we have already determined from independent astronomical statements and incidentally proves that there must be some mistake in the statements ascribed to Garga.

191. The objection that the year found by us does not agree with the years in the dynasties in the Purāṇas and with those given by Garga is thus completely replied to.

192. The second objection is that in the *Śatapatha Brāhmaṇa*, there is a reference to Janamejaya, the great grandson of the Pāṇḍavas, that therefore, the Pāṇḍavas must have lived prior to the compilation of the *Śatapatha Brāhmaṇa* and that, as the date of the *Śatapatha Brāhmaṇa* is proved to be 3100 B.C. by the statement in it that the Kṛittikās never swerve from the East ["एता (कृत्तिकाः) ह वै प्राच्यै दिशो न च्यवंते ॥ २ ॥"....][89] the date of the Mahābhārata War must be taken at least as far back as 3100 B.C.

193. To this the reply is threefold. Firstly, the king Janamejaya, referred to in the *Śatapatha Brāhmaṇa*, is not the same as the great grandson of the Pāṇḍavas. Secondly, the date of the *Śatapatha Brāhmaṇa* is not really 3100 B.C. Thirdly, the statement about the Kṛittikās may be merely a traditional one and not based upon the actual observation by its author.

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[87] The reign of the Karkotakas ended in the thirty-first year of the Saptarshi Era (Chapter, IV verse 716), *i.e.*, in 777 of the Śaka Era. Before that, Karkotakas ruled for 258½ years, the kings in the third chapter for 590½ years, those in second chapter for 192 years, 21 kings from third Gonanda for 1014¾ years and 52 kings from first Gonanda for 1266 years. This gives the year 2544¾ before the Śaka Era.

[88] See verse 7 of the Second Taranga.

[89] *Śatapatha Brāhmaṇa*, Kaṇḍa 2, Chapter 1, Brāhmaṇa 2.

194. We shall consider these in detail.

195. The first reply is as follows:—That the Pāṇḍavas had also an ancestor named Janamejaya is proved by the list of kings in their line given in Chapter 95 of the *Ādi Parva* and by the express statement in the *Harivanśa Purāṇa* that there were two Janamejayas in the line.

" द्वावृक्षौ तव वंशेऽस्मिन् द्वावेव च परिक्षितौ ।
भीमसेनाह्वयौ राजन् द्वावेव जनमेजयौ "[90] ॥ १०४ ॥

That the father of this Janamejaya was Parikshit and that this Janamejaya had brothers named Bhīmasena, Kakshasena, Indrasena, Ugrasena, Susheṇa, Chitrasena, and several unnamed others, is proved by the verses 53 to 54 in Chapter 94 of the *Ādi Parva*. There is thus no difficulty in identifying Janamejaya of the *Śatapatha Brāhmaṇa* with this ancestor of the Pāṇḍavas.

196. The only hitch is that the *Śatapatha Brāhmaṇa* mentions Śrutasena as a brother of Janamejaya while we do not get this name in Chapter 94 of the *Ādi Parva*. This, however, is not an unsurmountable difficulty. Śrutasena may be the name of one of the several brothers of Janamejaya, whose names are not mentioned in Chapter 94 of the *Ādi Parva*. Or Śrutasena and Susheṇa may be a mis-reading for each other. We get such mis-readings in Paurāṇic lists of kings very often. If we see the lists of kings in the line of Nimi, we find Swaḥketu (स्वःकेतु) for Suketu (सुकेतु), Mahāvīra (महावीर) for Mahāvīrya (महावीर्य), Sudhṛit (सुधृत्) for Sudhṛiti (सुधृति), Marut (मरुत्) for Maru (मरु), Kṛitiratha (कृतिरथ) for Kīrtiratha (कीर्तिरथ), Pratidhaka (प्रतिधक) for Pradīpaka (प्रदीपक) etc. Moreover, we can infer from the words तस्यापि in

" योऽयं सांप्रतमवनीपतिः परिक्षित्तस्यापि जनमेजयश्रुतसेनोग्रसेनभीमसेनाः पुत्राश्चत्वारो भविष्यंति ".[91]

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[90] *Harivanśa Parva of Harivanśa Purāṇa*, Chapter 32.
[91] *Vishṇu Purāṇa*, 4. 21. 1.

[*Translation.*—" The king Parikshit, (the grandson of the Pāṇdavas), who is reigning at present, *also* had four sons named Janamejaya, Śrutasena, Bhīmasena and Ugrasena], that like Janamejaya, the descendant of the Pāṇḍavas, their ancestor Janamejaya also had a brother named Śrutasena. Thus this difficulty passes off."]

197. However, the most important point against the objector is that the Janamejaya in the *Śatapatha Brāhmaṇa* cannot possibly be identified with Janamejaya, the descendant of the Pāṇḍavas; because the Aśvamedha of Janamejaya and his brothers, referred to in the *Śatapatha Brāhmaṇa*, was performed by the priest named Śaunaka Indrota while that of the descendant of the Pāṇḍavas was performed by Soma-Śravas, son of Śruta-Śravas, as stated in Chapter III of the *Ādi Parva*. Indrota-Śaunaka is also stated to be the priest of Janamejaya, the ancestor of the Pāṇḍavas and the grandson of Kuru, in the *Harivanśa*, Chapter 30, verses 9 to 16. These verses are as follows:—

कुरोः पुत्रस्य (पौत्रस्य) राजेंद्र राज्ञः पारिक्षितस्य ह ।
जगाम स रथो नाशं शापाद् गार्ग्यस्य धीमतः ॥ ९ ॥
गार्ग्यस्य हि सुतं बालं स राजा जनमेजयः ।
वाक्शूरं हिंसयामास ब्रह्महत्यामवाप सः ॥ १० ॥
स लोहगंधी राजर्षिः परिधावन्नितस्ततः ।
पौरजानपदैस्त्यक्तो न लेभे शर्म कर्हिचित् ॥ ११ ॥
ततः स दुःखसंतप्तः नालभत्संविदं क्वचित् ।
इंद्रोतः(तं) शौनकं राजा शरणं प्रत्यपद्यत ॥ १२ ॥
याजयामास चेंद्रोतः शौनको जनमेजयं ।
अश्वमेधेन राजानं पावनाय द्विजोत्तमः ॥ १३ ॥
स लोहगंधोव्यनशत्तस्यावभृथमेत्य ह ।
स च दिव्यो रथो राजन् वसोश्चेदिपतेस्तदा ॥ १४ ॥
दत्तः शक्रेण तुष्टेन लेभे तस्माद्बृहद्रथः ।
बृहद्रथात्क्रमेणैव गतो बार्हद्रथं नृपम् ॥ १५ ॥
ततो हत्वा जरासंधं भीमस्तं रथमुत्तमम् ।
प्रददौ वासुदेवाय प्रीत्या कौरवनंदनः ॥ १६ ॥

Translation of the relevant portion of these is as follows:—"That chariot of the grandson of Kuru and the son of Parikshit was destroyed by the curse of Gārgya (9). That King named Janamejaya killed a talkative son of that Gārgya and the King thereby committed Brahmahatyā, *i.e.*, murder of a Brāhmaṇa (10). That King was therefore abandoned by the people and did not get happiness anywhere (11). The King therefore took shelter of Indrota-Śaunaka (12). Indrota-Śaunaka performed Aśvamedha for the King and purified him (13). The divine chariot was then given to Vasu, the King of the Chedis, by Indra and King Bṛihadratha got it from Vasu (14). From Bṛihadratha, the chariot went to Jarāsandha and Bhīma obtained it by killing Jarāsandha (15). Then Bhīma (a Pāṇḍava) gave that chariot to Vāsudeva (Śree Kṛishṇa) (16)...."[92]

This passage and especially the verses 15 and 16 clearly show that this Janamejaya was an ancestor of the Pāṇḍavas and that he killed a Brāhmaṇa and that he was freed from this sin by the performance of Aśvamedha by the priest Indrota-Śaunaka. The same story is told in the *Śatapatha Brāhmaṇa* in the following words:—" एतेन हैंद्रोतो देवापः शौनकः । जनमेजयं पारिक्षितं याजयांचकार । तेनेष्ट्वा सर्वां ब्रह्महत्यामपजघान । सर्वां पापकृत्यां सर्वां ब्रह्महत्यामपहंति योऽश्वमेधेन यजते ॥ १ ॥ कांड १३, अध्याय ५, ब्राह्मण ४," Kāṇḍa 13th, Chapter 5th, Brāhmaṇa 4.

[*Translation.*—" Indrota Devāpa Śaunaka got Parikshit's son Janamejaya to perform this Aśvamedha. He, *i.e.*, Janamejaya cast off all Brahmahatyā (sin of murdering a Brāhmaṇa by performing this Aśvamedha). For he who performs an Aśvamedha casts off all sins and all Brahmahatyās."]

[92] *Note.*—In the 9th verse the reading is 'पुत्रस्य'. This reading is clearly wrong. It ought to be पौत्रस्य because verses 87-100 of Chapter 32 of the First Parva of *Harivanśa* show that Janamejaya was the son of Parikshit, the son of Kuru. The word पारिक्षितस्य in verse 9 of Chapter 30 proves the ame.

On the other hand the story in Chapter III of the *Ādi Parva,* relating to Janamejaya, the descendant of the Pāṇḍavas, is quite different; there the sin committed by Janamejaya and his brother was the beating of the divine dog and not the murder of a Brāhmaṇa and his priest was Soma-Śravas, the son of Śruta-Śravas.[93] All this clearly shows that Janamejaya, referred to in the *Śatapatha Brāhmaṇa,* was an ancestor of the Pāṇḍavas and not their descendant.

198. Now the second reply is as follows:—The *Śatapatha Brāhmaṇa* says that the Kṛittikās do not swerve from the East. This has been taken to mean that they were exactly in the East, when on the horizon, and the date of the *Śatapatha Brāhmaṇa* has been calculated on that supposition. But as a matter of fact they or any star or planet except the Sun or the Moon cannot be seen when on the horizon; they can be seen only after they rise some degrees above the horizon. I have found by actual observation, that the Kṛittikās cannot be seen before they rise 13 degrees above the horizon and then only very faintly. How then, could it be known that the Kṛittikās were in the East when on the horizon ? That can be known only by mathematical calculation ; but it is absolutely wrong to suppose that mathematics was then so much advanced as to enable such a calculation to be made. In fact such an advance was not made before the Sūrya-Siddhānta was written in Śaka Era 420. We have, therefore, to understand by the statement in the *Śatapatha Brāhmaṇa* that the Kṛittikās were in the East when they rose sufficiently high above the horizon so as to be distinctly seen.

199. This is supported by the following passage in the *Baudhāyana Śrauta Sūtra* which directs that the East should be known by the distinct appearance (संदर्शन) of the Kṛittikās. The passage is as follows:—तदेतां प्राचीनवंशां शालां मापयंति। कृत्तिकाः खल्विमाः प्राचीं दिशं न परिजहति। तासां संदर्शनेन मापयेत् इत्येकं। श्रोणासंदर्शनेन मापयेदित्येकं ॥[94]

[93] See verses 1-20.

[94] *Praśna* 25, Khaṇḍa 3, Bhāga 5.

[*Translation.*—"Then they should lay out a buidling, whose rafters are pointed to the East. These Kṛittikās do not swerve from the East. He should lay out such a building by the distinct appearance of these Kṛittikās or by the distinct appearance of the Śravaṇa."] It must be noted here that the Śravaṇa, whose latitude is 29° North and whose declination (क्रांति) cannot, therefore, be less than 5° at any time, can never *be* in the East when on the horizon. However supposing its declination to be the least, that is, + 5°, it can be in the East in the Kurukshestra only when it rises 10° above the horizon and, of course, when it is distinctly seen. If its declination be more than + 5° it can be in the East in the Kurukshetra when it rises more than 10° above the horizon and when, of course, it may have been regarded as being distinctly seen. We have, therefore, to attach the same meaning to the statement about the Kṛittikās, *i.e.*, that the Kṛittikās were in the East when they rose some degrees above the horizon and were just distinctly seen. Now distinctness and indistinctness are such indefinite things that one observer may regard the Kṛittikās as being distinctly seen when 17° above the horizon, while another may regard them as being distinctly seen when 20° above the horizon. We have seen that the Śravaṇa was regarded as distinctly seen when more than 10° above the horizon and the Śravaṇa is a very bright star as compared with the Kṛittikās. We can, therefore, safely assume that the Kṛittikās were regarded as distinctly seen when 20° above the horizon. The date calculated from this assumption, *i.e.*, that they were in the East when they rose 20° above the horizon in the Kurukshetra (latitude 30°), is 1170 years before the beginning of the Śaka year, *i.e.*, 1092 B.C. If, however, we suppose that the Kṛittikās could be seen distinctly when 13° above the horizon, the date of the *Śatapatha Brāhmaṇa* will have to be carried 630 years back, *i.e.*, it would be 1800 years before the Śaka Era or 1722 B.C. This is the earliest date of the *Śatapatha Brāhmaṇa.*

200. Closer examination of the *Śatapatha Brāhmaṇa* supports this view. The constellation of the Kṛittikās has

been recommended by the *Śatapatha Brāhmaṇa* as one of the constellations on which fire is to be consecrated (आदधीत). It only recommends some constellations from the Kṛittikās to the Chitrā and no constellation after the Chitrā. What is the reason? The reason is clearly suggested by the *Śatapatha Brāhmaṇa* itself in the passage :—

वसंतो ग्रीष्मो वर्षाः । ते देवा ऋतवः शरद्धेमंतः शिशिरस्ते पितरः.... ॥ १ ॥ स यत्रोदगावर्तते देवेषु तर्हि भवति .... यत्र दक्षिणावर्तते पितृषु तर्हि भवति.... ॥ ३ ॥ स यत्रोदगावर्तते तर्ह्यग्नी आदधीत.... ॥ ४ ॥[95]

[*Translation.*—" The seasons Vasanta (Spring), Grīshma (Summer), Varshā (Rains) are gods and the seasons Śarat (Autumn), Hemanta (Winter) and Śiśira (Bitter Winter) are Pitaraḥ (Manes). When the Sun moves in the part of the sky north of the Equator, he is amongst the gods and when he moves in the part of the sky south of the Equator he is amongst the manes. Fire should be consecrated when the Sun is in the north of the Equator."]

201. This clearly shows that the *Śatapatha Brāhmaṇa* omits constellations after the Chitrā because they were to the south of the Equator and that the constellation of the Kṛittikās was to the north of the Equator in the days of the *Śatapatha Brāhmaṇa*. This is also supported by the *Taittirīya-Brāhmana* which says that the constellations from the Kṛitticās to the Viśākha are divine constellations (देवनक्षत्र) and hat the others are constellations of Death (यमनक्षत्र) (see *Taittirīya Brāhmaṇa*, 1. 5. 2. 7). Now the Kṛittikās cannot be to the north of the Equator in 3100 B.C. but they can be so only after 2322 B.C. Therefore, the date of the *Śatapatha Brāhmaṇa* may be any after 2322 B.C. and not before that and we have already proved it to be any later than 1722 B.C. Thus even if we supose that the Janamejaya, referred to by the *Śatapatha Brāhmanna*, is the great grandson of the Pāṇḍavas, the objection raised does not hold: for, the *Śatapatha Brāhmaṇa* can have been composed after 1197 B.C.

[95] Kaṇḍa II. Chapter 1. Brāhmaṇa III

(our date of the Mahābhārata War) and can refer to the great grandson of the Pāṇḍavas.

202. Incidentally we may mention that the *Śatapatha Brāhmaṇa* was in fact composed about the year 1150 B.C. after the Mahābhārata War. The Śukla Yajur Veda being only an improved edition of the Kṛishṇa Yajur Veda and the *Śatapatha Brāhmaṇa* being only the Brāhmaṇa of the Śukla Yajur Veda, the *Śatapatha Brāhmaṇa* could have been composed only after Vyāsa, the grandfather of the Pāṇḍavas, prepared[96] the Sanhitā of the Kṛishṇa Yajur Veda. Now the date of the Pāṇḍavas has been proved by indisputable astronomical evidence to be 1251 B.C. to 1175 B.C. and the history of the Pāṇḍava's great grandson, Janamejaya, given in the *Vāyu Purāṇa*, narrated in Lecture IV[97] shows that the Śukla Yajur Veda and the *Śatapatha Brāhmaṇa* were composed in his reign. All this shows that the *Śatapatha Brāhmaṇa* was composed about the year 1150 B.C.

203. There are only two difficulties in this view (1) The statement about the Kṛittikās and (2) the fact that the Aśvamedha of the Pāṇḍavas is not referred to in the *Śatapatha* Brāhmaṇa though it refers to the Aśvamedha of so many other kings. We have seen the real meaning of the statement about the Kṛittikās and that meaning does not conflict with the date of *Śatapatha Brāhmaṇa* being 1150 B.C. especially if we suppose the statement to have been based upon traditional information; and the Aśvamedha of the Pāṇḍavas may not have been referred to in the *Śatapatha Brāhmaṇa* as the author may not have thought it necessary to refer to it for reasons of his own.

204. The third reply is the following:—We have seen that the *Śrauta Sūtras* of Bhaudhāyana have got a statement about the Kṛittikās just like that in the *Śatapatha Brāhmaṇa*[98]

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[96] See *Mahābhārata*, *Ādi Parva*, Chapter 63, verse 88 and Chapter 105, verse 15.

[97] See *infra*, para. 407.

[98] See *supra*, para. 199.

but the *Sūtras* of Baudhāyana are unquestionably a work of a very recent date[99] and we have necessarily to suppose that the statement about the Kṛittikās in that work is based upon traditional information and not upon actual observation by its authors. Can we not say the same thing then about the statement in the *Śatapatha Brāhmaṇa*, especially if we have certain other evidence to show that it is of a very recent date? And we have already seen that there is such evidence.

205. In conclusion the date of the *Śatapatha Brāhmaṇa* is subsequent to that of the Pāṇḍavas and is 1150 B.C. approximately. This disposes of the objection we are discussing.

206. The third objection is this : On the day of the War found by us the mean Moon is 268° in the morning. But the *Mahābhārata* says that the Moon was in the Jyeshṭhā, *i.e.*, about 230°. In that year the Sun also would turn to the North 41·06 days after the morning of the first day of the War. But the *Bhārata* shows that the Sun turned to the North 65·6 days after the beginning of the War.[100] Both these mistakes show that the year found by us is wrong.

207. This is the third objection and its reply has already been indicated.[101] The reply is that the constellation of the Moon and the day of the turning of the Sun, given in the *Mahābhārata* were arrived at by calculation by the wrong process in vogue in those days. We have already seen that the dimensions of the year and of the lunar month then taken were wrong and that one Lunar Month had to be omitted to correct the mistake and that even then the mistakes were not completely corrected and there was actually a mistake of about two *Tithis* in the *Tithis* as then calculated. We have also seen that 64 *Tithis* were then taken to be equal to 63 days.

[99] Because Baudhayána refers to Goutama whose date is proved to be 613 B.C. in para, 433. See *Baudhāyana Dharma Sūtra*, 2. 2. 77 and *Gautama Smṛiti*, 10. 2–5.

[100] According to the calendar of those days Uttarāyaṇa comes 66 *Tithis* after the Kārtika Amāvāsyā which ended at 36 Ghaṭis from the mean sunrise on the first day of the War. Thus we get 65·6 days.

[101] See *supra*, para. 50.

We have also seen that at the date of the War 30 Yugas and about three years had passed from the beginning of the system of calendar then in vogue. Now one Yuga is equal to 62 lunar months or 1860 *Tithis*; they were taken as being equal to 1830·9375 days. During this time the Moon was, of course, taken to perform 67 (62 + 5) revolutions. It actually goes 5·08858 degrees more. In 30 Yugas and three years it would go 155·71 degrees more. But when one lunar month is omitted 29°·1 are deducted from this excess, as it were. Four lunar months are omitted in 30 Yugas, that is, there were four Kshayamāsas before the War; therefore this excess of motion was reduced by 116°·4. Thus only 39°·31 remain to be corrected. Deducting this from the actual mean Moon in the morning of the day on which the War began we get 268°-39°·31, *i.e.*, 228°·69. This agrees with the statement in the *Mahābhārata*. For if the star Dhanishṭha whose longitude is 297°, is the beginning of the system, the Moon at the end of the Amāvāsyā of the Kārtika of the Idāvatsara must be 233°·13 according to the calculation of the *Vedānga-Jyotisha*. But as shown above that Amāvāsyā ended at 35⅝ Ghaṭīs from the sunrise. Therefore at mean sunrise the Moon of the calendar then in vogue would be 225·31 degrees. This agrees with the Moon obtained above only approximately. This means that the mean Moon at the beginning of the system was 300·38 degrees and not 297°. For, in that case only, the calculated Moon[102] would be 228·69 degrees in the morning of the first day of the War and would agree with the position of the Moon which ought to have been got by the calculation then in vogue, *i.e.*, 228·69 degrees.

208. Now one Yuga is equal to 1830·9375 days; while five sidereal years are equal to 1826·2815 days. Therefore the mistake in the Sun in one Yuga is equal to 4·59 degrees. In 30 Yugas and three years the mistake would come to 140·45 degrees and at each Kshyamāsa 29·1 degrees would be

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[102] This means "calculated according to the *Vedānga-Jyotisha*."

corrected; or 116°·4 would be corrected by four Kshaya-māsas. Therefore the mistake of 24 degrees would remain. The actual mean Sun in the morning of the first day of the War is 252°. Therefore the calendar Sun ought to have been 228 degrees. This agrees with the statement in the *Mahābhārata*; for, if the longitude of the Dhanishṭhā is 297 degrees, the calendar Sun of the day, would be 233·13 degrees at the end of the Amāvāsyā of the first day of the War and 232½° in the morning of that day. This agrees with the Sun obtained above only approximately. Therefore the mean Sun at the beginning of the system must be 292½°; for, then only it would be 228° by the calculation of those days.

209. This shows that in the beginning of the system the mean Sun was 292½° and the mean Moon was 300°·38. Thus the *Tithi* was 0·656 corresponding to 0·646 days, though it was taken to be equal to Zero. By the end of 30 Yugas and three years this mistake ought to increase by 30 × 0·0411 days *plus* 0·0246 days, *i.e.*, 1·2576 days. The total mistake must be therefore 1·9036 days (1·2576+0·646) in the time of *Tithi*, as then calculated and we find that this is actually the case. For the mean Āśvina Amāvāsyā really ended at 9 Ghaṭīs 28 Palas on Friday; while that of the calendar of those days ended at 3 Ghaṭīs 45 Palas from sunrise on Sunday, thus showing a difference of 1·905 days.

210. In the beginning of Uttarāyaṇa the true Sun must be 270° from the Equinox. The longitude of the Equinox was 26° in those days. Therefore, the true Sun at the beginning of the Uttarāyaṇa ought to be 296°, while we have seen that the mean Sun in the beginning of the system was 292½° and the true Sun would be 294°. Thus the Uttarāyaṇa was taken to begin two days earlier than the real one.

211. Now one Yuga is equal to 1830·9375 days and five solar years are equal to 1826·211 days. There is thus a mistake of 4·7265 days in one Yuga. Therefore, in 30 Yugas and three years the mistake would be 144·63 days.

One Kshayamāsa corrects it by 29·53 days and four Kshayamāsas by 118·12 days. The mistake of 26·51 days would, therefore, still remain to be corrected at the time of the War. But we have seen that at the beginning of the system of that calendar the Uttarāyaṇa was taken two days earlier than the real one. Therefore, in the year of the War the Uttarāyaṇa must have been taken 24·51 days after the real one. This is what has actually happened.[103]

212. This clearly shows that all the mistakes in the *Mahābhārata* calendar can be explained by the proposition that the system of the calendar began thirty Yugas and three years (35 lunar months) before the War began. This objection, therefore, does not hold good.

213. The fourth objection to the year of the War being 1197 B.C. is that the Kali Yuga began a very few years before the year of the War and the Kali Yuga began in 3102 B.C. according to the Astronomical Siddhāntas and that therefore the War was fought in 3102 B.C. or a few years after 3102 B.C. This objection will be fully stated and thoroughly replied to in Lecture III, after determining the dimensions and the starting point of the Yugas. We shall see there that the Kali of the *Mahābhārata* is quite different from the Kali of the Astronomical Siddhāntas.

214. The fifth objection is this. The statements in the *Mausala Parva* (त्रयोदश्याममावास्यां तां दृष्ट्वा प्राब्रवीदिदं । चतुर्दशी पंचदशी कृतेयं राहुणा पुनः ॥ प्राप्ते वै भारते युद्धे प्राप्ता चाद्य)[104] require that the Solar Eclipse should have happened during the 14th *Tithi* on a day in the morning of which there was the 13th *Tithi*. But the Solar Eclipse that happened 270 months after the Solar Eclipse in the year of the War happened at 5 days 22 Ghaṭīs and 25 Palas and on that day the 13th *Tithi* would end at 32 Ghaṭīs (for, 270 lunar months are equal to 7973 days 26 Ghaṭīs and in the year of the War the 13th

[103] See *supra*, para. 206.
[104] See *supra*, para. 47.

Tithi of the Solar Eclipse ended at 5 days 6 Ghaṭīs[105]) so that in fact the Solar Eclipse occurred during the 13th *Tithi*. This conflicts with चतुर्दशी पंचदशी कृतेयं (the 14th *Tithi* has been made the Amāvāsyā). The reply is this :—

215. In the year of the War the mistake in the Sun had already amounted to 24 degrees as shown above.[106] After two years it would amount to 26° and one Kshayamāsa must have been taken at that time; and at that time the correction might have been made even in the time of the *Tithi* in view of the mistake of two *Tithis* just discovered; or they might have given effect to the principle told in " स्वराक्रमेते सोमार्कौ यदा साकं सवासवौ ॥ स्यात्तदादियुगं etc.,"[107] and might have corrected the *Tithi* also. This would be after 27 lunar months from the Amāvāsyā of the Solar Eclipse in the year of the War. Twenty-seven lunar months are equal to 797 days 20 Ghaṭīs 36 Palas. So the Amāvāsyā of the 27th Month, from the Solar Eclipse in the year of the War, would end at 24 Ghaṭīs, 36 Palas from sunrise by the calendar of those days (for, in the year of the War the Calendar Amāvāsyā of Āśvina ends at 4 Ghaṭīs from sunrise). These 24 Ghaṭīs and 36 Palas may have been omitted at the time of the correction when omitting the lunar month and in this way the 13th *Tithi* of the Solar Eclipse in the *Mausala Parva* would end at 7 Ghaṭīs 24 Palas from sunrise and the Solar Eclipse would happen during the 14th *Tithi* as required. In कृतेयं राहुणा पुनः the word पुनः may have been used to mean " in spite of correction ".

216. The sixth objection to the year is that the inconsistencies between the statements in the *Mahābhārata* show that the statements are merely imaginary and that no real year can be calculated from them. The reply to this objection has been indicated already. It is not legitimate

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[105] See *supra*, para. 154.
[106] See *supra*, para. 208.
[107] See *supra*, para. 38.

to suppose that statements in a work professing to be historical are merely imaginary, only because there are inconsistencies between them. It is proper to suppose that the inconsistencies are caused by mistakes in the reading of the text and such other causes. We have explained the inconsistencies by very probable mistakes in the reading of the text and such other causes. Moreover, we do not require all the astronomical statements for calculating the year. A few of them are sufficient to give us the year by calculation. We have seen that the other statements agree with the year calculated from these few statements. This would not have been possible if all the statements were merely imaginary.

217. The seventh objection is that raised by the late Mr. C. V. Vaidya and is based upon the following statement of Megasthenes quoted by Arrian. The statement is this:—

" From the time of Dionysos to Sandrakottos the Indians counted 153 kings and a period of 6042 years, but among these a republic was thrice established and another to 300 years and another to 120 years. The Indians tell us that Dionysos was earlier than Herakles by fifteen generations (M'Crindle's *Ancient India*, pages 208 and 209) ". Mr. Vaidya's argument is that the generations between Dionysos (or Daksha) and Sandrakottos (or Chandragupta) being 153 and the generations between Dionysos and Herakles (Harikrishṇa or Śree Kṛishṇa) being 15, the generations between Śree Kṛishṇa and Megasthenes or Chandragupta must be 138 and therefore the period of time between the Pāṇḍavas and Chandragupta must be 138×20 or 2760 years.[108] This is, however, quite wrong. For we find these numbers of generations even in the Purāṇas, and their reliability is not advanced merely by having passed through the mouths of Megasthenes and Arrian. We shall explain ourselves:—

[108] See page 6 of Section IV of *History of the Sanskrit Literature*

218. The *Harivanśa* in Chapters 9–10 and 33–34 gives 15 generations from the Second Daksha to Śree Kṛishṇa and the Purāṇas give 153 generations from the First Daksha to Chandragupta (18 from Swāyambhuva Manu, contemporary of the First Daksha to Second Daksha the son of Prachetas, 96 from the Second Daksha to Bṛihadbala, the contemporary of the Pāṇḍavas, 37 between the Pāṇḍavas and the Nandas, and 2 of the Nandas, if we accept the maximum generations given by the Purāṇas). Megasthenes must have taken his information from the Purāṇas and his statement about generations exactly agrees as shown just now with the statements of some of the Purāṇas as we have them at present. If these statements in the Purāṇas are not reliable, how can the statements of Megasthenes agreeing with these statements be reliable? And these statements in the Purāṇas are certainly not reliable, because there is no agreement between the Puraṇas themselves. All Purāṇas agree that the generations between the Pāṇḍavas and the Nandas are 37, while they disagree about generations between Ikshvāku and Śree Rāma, some giving 63, some 52 and the *Rāmāyaṇa* itself 35 and all the Purāṇas giving 22 generations between Nimi, brother of Ikshvāku, and Sīradhvaja, the father-in-law of Śree Rāma. The Purāṇas also disagree about generations between Śree Rāma and Bṛihadbala, the contemporary of the Pāṇḍavas. They also give 42 generations between the Second Daksha and the Pāṇḍavas the contemporaries of Śree Kṛishṇa, while the *Harivanśa* gives only 15 generations between the Second Daksha and Śree Kṛishṇa. It is clear that Megasthenes made the statements without considering the reliability of the statements in the Purāṇas and without distinguishing between the First and the Second Daksha.[109]

219. The unreliability of Megasthenes' statement is seen more clearly if we consider the years given by him. Mr. Vaidya has only blinked this point. 6042 years for

[109] See next Lecture for information about generations and two Dakshas.

153 generations gives an average of 39·5 for one generation and this is *prima facie* absurd. This figure can only be explained in the following way. The years of Kalpa Era (Kali Era) which probably elapsed when Megasthenes wrote were 2811. For, it is well known that Megasthenes acted as a Greek ambassador between 302 and 288 B.C., *i.e.*, between Kalpa Era (Kali Era) 2800 and 2814.[110] It appears that this figure 2811 was doubled and 420 years of the two republics added to it thus making the figure 6042. This shows the utter unreliability of the statements of Megasthenes. He has given us only the least number of generations found in the Purāṇas between the Second Daksha and Śree Kṛishna, the greatest number of generations between the First Daksha and Chandragupta and double the years from the beginning of the Kalpa plus the years of the two republics, although the date of the First Daksha is about 432 Kalpa Era and although the years of the republics are already included in the years of the Kalpa Era already elapsed till then.[111] There is thus so much inconsistency in the various statements of Megasthenes that no reliable inference can be drawn from them.

220. All objections against the year of the War found by us have now been removed. We shall now consider objections to the *Tithi* found by us.

221. The first objection is based upon the following statement made by Balarāma on the battlefield on the 18th day of the War.

चत्वारिंशद्दिनान्यद्य द्वे च मे निःसृतस्य वै ।
पुष्येण संप्रयातोऽस्मि श्रवणे पुनरागतः ॥ ६ ॥[112]

[*Translation.*—" Forty-two days have elapsed since I went away (from you). I went on the Pushya constellation and have come now on the Śravaṇa constellation."]

[110] See M'Crindle's *Ancient India*, page 14.

[111] See Lecture III for information about the Kalpa Era; and Lecture IV for republics and dates of Dakshas.

[112] *Śalya Parva*, Chapter 34.

If this statement is accepted as true we get the Śravaṇa on the 18th day of the War and, of course, the Mṛiga on the 1st day. As the constellation of the Kārtika Amāvāsyā was the Jyeshṭhā it is clear that on these data the War must be held to have begun on the 14th *Tithi* of the bright half of the Mārgaśīrsha. It must, therefore, be supposed that though it was first intended to begin the fight on the Kārtika Amāvāsyā it was postponed to the 14th *Tithi* of the bright half of the following Mārgaśīrsha.

222. If we accept the year found by us as correct, this objection cannot hold. For in that year the Mercury became invisible[113] as shown before on Mārgaśīrsha Vadya 3 and as this happened on the 18th day of the War, the war must have begun on the Pratipadā, which was the Amāvāsyā of the Kārtika by the calendar of those days. Moreover if we suppose that the War began on the 11th or the 14th *Tithi* of the bright Paksha of the Mārgaśīrsha or on the 17th day from an Amāvāsyā, the constellation of which was the Jyeshṭhā, we do not get the Mercury in the Jyeshṭhā in the morning of the first day of the War as required by श्यामोग्रहः प्रज्वलितः etc. (see paragraph 122). Thus the fast-moving planet Mercury fixes the day of the beginning of the War after the year of the War is fixed.

223. Independently of the year of the War found by us, the inference of the objector as regards the *Tithi* of the beginning of the War, is incompatible with the statement in "अष्टपंचाशतं राम्यः" etc., already discussed by us.[114] According to this statement there ought to be 67 nights between the beginning of the War and the death of Bhīshma that took place on the 8th *Tithi* of the Māgha. But if the day proposed by the objector be accepted there are only 43 or 42 nights between these two events. Many attempts have therefore been made to force out from अष्टपंचाशतं a meaning different

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[113] See *supra*, para. 120 and para. 117.
[114] See *supra*, para. 109.

from 58. But they do not even deserve mention and refutation. Therefore there is undoubtedly a conflict between the two statements. How then are the conflicting statements to be reconciled namely, those in अष्टपंचाशतं राञ्यः etc., and in चत्वारिंशद्दिनान्यद्य द्वे च मे etc. ? Neither statement can be shown to be an interpolation for we can see no motive for interpolation of either. Moreover the idea of interpolation should not be entertained if correction of reading serves our purpose. My suggestion is that the words "श्रवणे" and "पुष्येण" have been interchanged in the aforesaid statement in *Śalya Parva* so that the real reading is as follows :—

चत्वारिंशद्दिनान्यद्य द्वे च मे निःसृतस्य वै ।
श्रवणे संप्रयातोऽस्मि पुष्येण पुनरागतः ॥

[*Translation.*—"Forty-two days have passed since I started (from Dwārakā). I started (from Dwārakā) on the Śravaṇa constellation and came to you again on the same Pushya constellation, *i.e.*, I came to you once on the Pushya constellation and on this second occasion also I came to you on the Pushya constellation.]

224. This agrees exactly with the other statement that the War began on the Jyeshṭhā constellation; for, in that case on the 18th day the constellation will be the Pushya. This also agrees clearly with :—

रौहिणेये गते शूरे पुष्येण मधुसूदनः ।
पांडवेयान् पुरस्कृत्य ययावभिमुखः कुरून् ॥ १६ ॥[115]

[*Translation.*—" After Balarāma had reached the Pāṇḍavas on the Pushya constellation, Śree Kṛishṇa marched with the Pāṇḍavas to the country called Kuru."

225. This verse ought to have been really between the 10th and 11th verse of the chapter, as according to the story in the *Udyoga Parva*, the dispute between Śree Kṛishṇa and Balarāma described in verses 11–13 took place after the Pāṇḍavas went to the Kurukshetra. But it is given here

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[115] *Śalya Parva*, Chapter 35.

after the 13th verse. I think some body misunderstood this verse to mean that fight began after Balarāma left the Pāṇḍavas on the Pushya constellation and having misplaced it interchanged the words ' श्रवणे ' and ' पुष्येण ' in ' चत्वारिंशद्दिनान्यद्य ', etc., and this is the cause of almost all our difficulties.

226. If we take the reading suggested by me, all the difficulties vanish. If on the other hand the reading as it is to-day is taken to be correct it conflicts with

ततो मन्युपरीतात्मा जगाम यदुनंदनः ।
तीर्थयात्रां हलधरः सरस्वत्यां महायशाः ॥ १३ ॥
मैत्रनक्षत्रयोगेस्म सहितः सर्वयादवैः ॥ १४ ॥[116]

where Balarāma is said to have gone to pilgrimage, *i.e.*, away from the Pāṇḍavas on the Anurādhā constellation (अनुराधा), *i.e.*, the day just before the day on which the War was proposed to begin. It also conflicts with

आज्ञापयच्च राज्ञस्तान् पार्थिवान्नष्टचेतसः ।
प्रयाध्वं वै कुरुक्षेत्रं पुष्योद्येति पुनः पुनः ॥ ३ ॥[117]

where it is stated that it was the Pushya on the day on which Śree Kṛishṇa was in the meeting held at Hastināpura; for, if Śree Kṛishṇa was in Hastināpura on the Pushya constellation, Balarāma could not have had a talk with Śree Kṛishṇa and the Pāṇḍavas as stated in the *Mahābhārata* in 157th chapter of the *Udyoga Parva*, verses 16–35 and then depart from him on the Pushya also, this having taken place after Śree Kṛishṇa's return from Hastināpura. These conflicts disappear by adopting our reading.

227. The commentator Nīlkaṇṭha tries to explain the first conflict by suggesting " पुष्येण हि पांडवेभ्यः प्रयाणं अनुराधातस्तीर्थयात्रार्थं इति विवेकः ". (A distinction should be made that on the Pushya Balarāma departed from the Pāṇḍavas and on the Anurādhā he departed for the pilgrimage.) But the second conflict, namely, that with आज्ञापयच्च etc. continues in spite of

[116] *Śalya Parva*, Chapter 35.
[117] *Udyoga Parva*, Chapter 150.

this distinction and the author of the *Bhārata* himself does not make the distinction suggested by Nīlakaṇṭha as would appear from the following verse:—

एवमुक्त्वा महाबाहुरनुज्ञातश्च पांडवैः ।
तीर्थयात्रां ययौरामो निर्वर्त्य मधुसूदनम् ॥ ३५ ॥[118]

[*Translation.*—" Balarāma having said this and being permitted by the Pāndavas, went to the pilgrimage making Śree Kṛishṇa return from him."] The meaning of this obviously is that the departure from the Pāṇḍavas and the departure for the pilgrimage were not two different things but were one and the same act. We have, therefore, to accept the reading suggested by me and if that is done, this objection to the *Tithi* of the beginning of the War found out by us and both the conflicts referred to above vanish. Moreover we see why the curious statement चत्वारिंशद्दिना etc., has been made. We see that it has been made purposely to state the curious occurrence that Balarāma happened to go to the Pāṇḍavas on both the occasions on the same Pushya constellation.

228. The second objection to the *Tithi* is as follows:—On the fourteenth day of the War the combatants fought even in the night and in the description of this night-battle, it is said very often that there was much darkness and eventually the rising of the Moon in the latter part of the night is also described. This conflicts with the beginning of the War on the Amāvāsyā, for according to it there would be bright moonlight on the 14th night of the War and the Moon would rise before the sunset. The older objectors, therefore, reach the conclusion that the War must have begun on the 14th *Tithi* as shown by the constellations mentioned in " चत्वारिंश-द्दिनान्यद्य द्वेच मे निःसृतस्यवै । पुष्येण संप्रयातो etc. " We have already seen the difficulties in this theory. To avoid some of these difficulties Mr. Karandikar, the learned Editor of the " *Kesarī* ", has improved this theory by suggesting that the

118 *Udyoga Parva*, Chapter 157.

War began on the 11th *Tithi* of the bright half of Mārga-śīrsha. He supports this theory by his own construction of the two verses "अष्टपंचाशतंरात्र्यः शयानस्याद्य etc."[119] His construction of these verses is this :—"I (Bhīshma) have passed 58 nights on this bed of sharp arrows, as if they were 100 years. The month of Māgha has come. This dark half of Māgha having yet to pass its three quarters, ought to be regarded as the bright half, *i.e.*, it is the fourth *Tithi* of the dark-half." From the 11th *Tithi* of the bright half of Mārgaśīrsha to the 4th of the dark-half of Māgha, we get 67 nights as required; therefore the War must have begun on the 11th of the bright-half of Mārgaśīrsha. This is what Mr. Karandikar says and he also insists that in the year of the War the Sun turned to the North on the 4th of the dark-half of Māgha as it does in the 5th year (इद्वत्सर) of the Yuga of five years.

229. This theory is untenable. Firstly this construction is wrong for reasons given in paragraph 110; secondly, it has either to reject as hyperbolical almost all the astronomical statements in the *Mahābhārata* and the *Harivanśa* or to misconstrue them. Moreover, it cannot explain the statement "चत्वारिंशतिरान्यद्य द्वे च मे etc." and has to regard this as an interpolation. But this verse is not an interpolation. It is a part of the conversation between Sanjaya and Dhṛitarāshṭra and not of the conversation between Janamejaya and Vaiśampāyana and is thus a part of the original *Bhārata*. No motive can be shown for interpolating this verse in chapter 34. Though chapters 35 to 54 containing description of "holy places" is an interpolation, there is no reason for supposing that any part of chapter 34 also is an interpolation. Moreover, the supposition of a mistaken reading is preferable to the supposition of an interpolation.[120]

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[119] See *Kesari* from 25-11-'38 to 27-1-'39.

[120] On Mr. Karandikar's theory according to the calendar of those days there would be the Bharaṇī constellation on the first day and the Mūla on the 18th day of the War. It can be said that the Mūla of the then calendar corresponds to the actual Śravaṇa, there being a mistake of three constellations

230. The assumption that the Sun turned to the North on the 4th of the dark-half of the Māgha, is also proved to be false by the statements in the *Aśramavāsika Parva*, which we will discuss here in detail.

231. We will first give here the statements and their translations:—

पांडवाः सर्वकार्याणि संपृच्छंति स्म तं नृपं ।
चक्रुस्तेनाऽभ्यनुज्ञाता वर्षाणि दश पंच च ॥ ६ ॥[121]

[*Translation.*—"The Pāṇḍavas consulted Dhṛitarāshṭra about all things to be done and did them with his permission for 15 years."]

ततः पंचदशे वर्षे समतीते नराधिपः ।
राजा निर्वेदमापेदे भीमवाग्बाणपीडितः ॥ १२ ॥[122]

[*Translation.*—"When the fifteenth year had passed away the King Dhṛitarāshṭra being distressed by the arrow-like words of Bhīma, became disgusted with life."]

These two statements show that the events narrated here happened at the end of the fifteenth year from the Bhārata War:

232. गांधार्यहमनुज्ञातः स्वयं पित्रा महात्मना ।
युधिष्ठिरस्यानुमते गंतास्मि न चिराद्वनं ॥ ८ ॥
अहं हि तावत्सर्वेषां तेषां दुर्द्यूतदेविनाम् ।
पुत्राणां दातुमिच्छामि प्रेतभावानुगं वसु ॥ ९ ॥[123]

in the Moon; and that in this way the constellation Śravaṇa mentioned in the verse चत्वारिंशदिनान्यद्य द्वे च मे can be explained. But this explanation has not been put forth by Mr. Karandikar and does not in fact help him. For, if the Śravaṇa in this verse is taken to be the real constellation then the Pushya mentioned in the same verse must also be taken to be the real constellation and must precede or be the same as that Pushya on which Śree Kṛishṇa was speaking in the meeting at Hastināpura; and since Balarāma left Pāṇḍavas after Śree Kṛishṇa returned from Hastināpura it is clear that Balarāma could not have left the Pāṇḍavas on the Pushya, the real Pushya or the Pushya according to the calendar of those days as the verse "चत्वारिंशदिनान्यद्य" etc. requires.

[121] *Āśramavāsika Parva*, Chapter 1.

[122] *Ibid.*, Chapter 3.

[123] *Ibid.*, Chapter 8.

[*Translation.*—" Oh Gāndhāri, I shall soon go to the forest being permitted by Vyāsa and Yudhishṭhira. But before that (तावत्) I wish to give away money for the benefit of my deceased sons who played the vicious play of dice."]

धृतराष्ट्रो महाराजो वनवासाय दीक्षितः ।
गमिष्यति वनं राजन्नागतां कार्तिकीमिमाम् ॥ ३ ॥[124]

[*Translation.*—" Dhṛitarāshṭra will go to the forest on the approaching Paurṇimā of the Kārtīka."]

दशाहमेवं दानानि दत्वा राजांबिकासुतः ।
बभूव पुत्रपौत्राणामनृणोभरतर्षभ ॥ १८ ॥[125]
ततः प्रभाते राजा स धृतराष्ट्रोंऽबिकासुतः ।
गांधारी सहितो धीमानभ्यनंदद्यथाविधि ।
आहूय पांडवान् वीरान् वनवासे कृतक्षणः ॥ १ ॥
कार्तिक्यां कारयित्वेष्टिं ब्राह्मणैर्वेदपारगैः ॥ २ ॥
निर्ययौ भवनात्ततः ॥ ३ ॥[126]

[*Translation.*—" Having in this way made gifts for 10 days, Dhṛitarāshṭra paid off the debts he owed to his sons and grandsons. Then on the following morning he called the Pāṇḍavas and congratulated them and having got performed the sacrifice on the Paurṇīmā of the Kārtika, went to the forest."]

These statements show that Dhṛitarāshṭra performed the Śrāddhas of his sons and grandsons for ten days previous to the Paurṇimā of the Kārtika.

233. Why did he perform these Śrāddhas then? They were not the days when his sons and grandsons died; for they died in the Mārgaśīrsha. Dhṛitarāsṭra must have performed these Śrāddhas on these days because they followed the Vishuva (Equinox); and were the days when the Sun was to the South of the Equator; for, says the *Mahābhārata*:—

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[124] *Āśramavāsika Parva*, Chapter 11.
[125] *Ibid.*, Chapter 14.
[126] *Ibid.*, Chapter 15.

पर्वसु द्विगुणं दानं ऋतौ दशगुणं भवेत् ।
अयने विषुवे चैव षडशीतिमुखेषु च ॥ १२४ ॥
चंद्रसूर्योपरागे च दत्तमक्षयमुच्यते ॥ १२६ ॥[127]

[*Translation.*—" Gifts made on a Parva become double, made at the beginning of seasons ten-fold, but at Ayana, Vishuva and Shadaśītimukhas and eclipses they become imperishable."]

Therefore, Dhṛitarāshṭra must have begun to perform those Śrāddhas on the Vishuva, that comes on the 4th *Tithi* of the bright-half of the Kārtika in the third year of the Yuga of five years in the *Vedānga-Jyotisha*. This conclusion is confirmed by the following express statement:—

पितृवृत्तेषु चाहःसु पुत्राणां श्राद्धकर्मणि ।
ब्राह्मणेभ्यो यथार्हेभ्यो ददौ वित्तान्यनेकशः ॥ ५ ॥[128]

[*Translation.*—" Dhṛitarāsṭra often used to give gifts to Brāhmaṇas in Śrāddha on the days when the Sun is amongst the Pitaras (*i.e.*, Manes), *i.e.*, to the South of the Equator."]

234. The commentator Nīlkaṇṭha construes " पितृवृत्तेषु चाहःसु " to mean " on the days of the death of the Manes ". He has entirely missed the point. He did not see that had this construction been correct, Dhṛitarāshṭra would not have performed the Śrāddhas in the Kārtika.

The statement in the *Śatapatha Brāhmaṇa* वसंतो ग्रीष्मो वर्षास्ते देवाऋतवः etc. already referred to[129] suggests that the real meaning of पितृवृत्तेषुचाहःसु is " the days when the Sun is to the South of the Equator ".

235. If Vishuva came on the 4th of the bright-half of the Kārtika in the year in which Dhṛitarāshṭra went to the forest, it must have come on the same *Tithi* in the year of the War, which was fought fifteen years before, as according to

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[127] *Vana Parva*, Chapter 200.
[128] *Aśramavāsika Parva*, Chapter 2.
[129] See *supra*, para. 200.

the *Vedānga-Jyotisha*, we get Vishuva on the same *Tithi* after every five years. The turning of the Sun to the North, therefore, came 93 *Tithis* after the Vishuva, *i.e.*, on the 7th *Tithi* of the bright-half of the Māgha, in the year of the War and Bhīshma admittedly died within a day or two from the same. Mr. Karandikar's theory is, therefore, clearly untenable in view of this.

236. Mr. Karandikar's theory is shown all the more untenable if the year of the War is taken into consideration. The year of the War is minus 1695·3, *i.e.*, 1197 B.C. At this time, the Sun turned to the North when it entered the constellation Dhanishṭhā and the *Vedānga-Jyotisha*, which had come into vogue in those days, also mentions this fact. Now it is an undisputed fact that the Sun was in the Jyeshṭha on the Amāvāsyā of the Kārtika according to the calendar of those days. The maximum number of days after that Amāvāsyā that the Sun would take to enter the Dhanishṭha is 68 as already shown.[130] Therefore, the Sun must have turned to the North within 68 days from that Amāvāsyā and not after 79 days, as Mr. Karandikar supposes. He must, therefore, find a year for the War, which would satisfy all the other conditions known from the *Mahābhārata*, which would agree with the statements in the Purāṇas and the *Harivanśa* and in which the Sun would turn to the North, when entering *Śatatāraka*. But this is an impossibility, as any one who has gone through the calculations of the year, given by us, will see. It should be noted in this respect that the year of the War suggested by Mr. Karandikar is 2009 before the Śaka Era, *i.e.*, 1931 B.C. or minus 2429 and that it does not at all satisfy all the conditions mentioned above. It does not give the planetary positions in the first group or the second group. And no year about 39 years previous to it gives the planetary positions and the eclipse mentioned in the *Harivanśa*. The *Harivanśa* gives the positions of the Mars, the Venus, the Mercury and the Sun and describes a total Solar Eclipse in

[130] See *supra*, para. 113.

unambiguous words. The Sun, the Mars and the Venus attain the same positions again after 32, 331, 1215, 1578 or 1909 years. Therefore the year that gives the planetary positions mentioned in the *Harivanśa*, just before the year of the War suggested by Mr. Karandikar, is – 1734·84 – 2 × 331 – 2 × 32, *i.e.*, – 2460·84. But this year does not give any eclipse of the Sun. The year suggested by Mr. Karandikar must, therefore, be rejected. Thus the year minus 1695·3 being certain, the day of the turning of the Sun to the North and thus the day of the beginning of the War is also certain beyond dispute. The arguments in para. 222 also show the same.

A deeper consideration of the statements in the *Mahābhārata*, also, points to the same conclusion. It is certain from "सप्तमाच्चापि etc.," that it was proposed to begin the War on the Amāvāsyā of the Kārtika (see *supra*, paragraphs 53–55). If the War was not started on this proposed day, the author of the *Mahābhārata* must have known that fact and in that case he could not have failed to mention it, especially because, he would have seen that such a statement as सप्तमाच्चापि etc., by itself without a statement about the postponement of the War, would have the tendency to mislead the reader. He would, therefore, have expressly mentioned the postponement of the War and the causes thereof. But it is a fact that he has never mentioned the postponement of the War nor the causes of the same. It follows, therefore, that the War was not postponed. Moreover in giving the statement "सप्तमाच्चापि" etc., the author cannot be supposed to have had any intention other than that of stating the day on which the War began and it is significant that the statement has not been contradicted anywhere.

237. How then, can the darkness and the moonrise (Chapter 184), forming part of the description of the battle on the 14th night of the War, be explained?[131]

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[131] See *supra*, para. 228.

238. The fact that the battle is described as being fought even before the moonrise or even before the lighting of torches, shows that there was some kind of light in the first part of the night and that could be no other than the moonlight. It also shows that the description of the darkness is only poetical, even the moonlight, not being quite sufficient for the purposes of the fight and that the description of the moonrise is an interpolation. This is confirmed also by the following considerations:—

239. (1) The ornaments and weapons are described as shining in the first part of the night in Chapter 154, verses 27-33. These verses are the following:—

भौमं रजोऽथ राजेंद्र शोणितेन प्रशामितं ।
शातकौंभैश्च कवचैः भूषणैश्च तमोऽभ्यगात् ॥ २७ ॥
ततः सा भारती सेना मणिहेमविभूषिता ।
द्यौरिवासीत्सनक्षत्रा राजन्यां भरतर्षभ ॥ २८ ॥
सा निशीथे महाराज सेनाऽदृश्यत भारती ।
अंगदैः कुंडलैर्निष्कैः शस्त्रैश्चैवावभासिता ॥ २९ ॥
तत्र नागा रथाश्चैव जांबूनदविभूषिताः ।
निशायां प्रत्यदृश्यंत मेघा इव सविद्युतः ॥ ३७ ॥[132]

[*Translation*.—"Oh king, the dust rising from the earth, settled down on account of blood and the darkness passed off on account of the ornaments and armours of gold. Then the army of the Bhāraṭas, ornamented by jewels and gold, appeared in the night like the sky with the stars and in the midnight that army was seen lighted by bracelets, ear-rings, necklets and weapons; and their elephants and chariots, ornamented by gold, appeared like clouds, ornamented by lightning."]

All this is not possible without the moonlight. It is stated clearly that when the dust settled down on account of blood, the darkness passed off on account of the light from the ornaments and armours. But the ornaments and armours shine only by reflected light. This shows that darkness was

[132] See *Droṇa Parva*, Chapter 154.

caused by dust and that there was some kind of light, of course, the moonlight.

239. (2) Even a day has been described as dark by reason of the atmosphere being filled with dust during a battle. Much more properly can then a moonlit-night be described as dark for the same reason. There is the description of darkness even after the moonrise, in the twilight and even after the sunrise. See the following verses:—

उद्भूता रजसो वृष्टिः शरवृष्टिस्तथैव च ॥ १६ ॥
तमश्चघोरं शब्दश्च तदा समभवत् महान् ।
नद्यौर्नभूमिर्न दिशः प्राज्ञायंत तथागते ॥ १८ ॥
सैन्येन रजसा मूढं सर्वमंधमिवाऽभवत् ।
नैव ते न वयं राजन् प्राज्ञासिष्म परस्परम् ॥ १९ ॥[133]
संभ्रांते तुमुले घोरे रजोमेघे समुत्थिते ।
द्वितीयामिव संप्राप्तां अमन्यंत निशां तदा ॥ ३० ॥[134]

[*Translation.*—" There arose the shower of dust and of the arrows and there also arose terrible darkness and sound. In this condition, the sky, the earth or the directions could not be known. All (army) became blind and stupefied on account of the dust (raised) by the army; Oh king, neither they nor we could recognize one another".] This describes a fight during twilight.

[*Translation.*—" When the terrible confusion began and when the cloud of dust arose they thought as if a second night, had arrived."] This describes a fight during the day.

239. (3) If the War began on the 11th *Tithi* of the bright half, there ought to be bright light on the first nights of the War in the beginning but in the description of the 1st day we have

प्राप्ते चास्तं दिनकरे न प्राज्ञायत किंचन ॥ ५२ ॥[135]

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[133] *Droṇa Parva*, Chapter 186.
[134] *Ibid.*, Chapter 187.
[135] *Bhīshma Parva*, Chapter 49.

(When the Sun had set nothing could be known *i.e.*, seen) and in the description of the 2nd day we have

उल्कासहस्रैश्चसुसंप्रदीप्तैः । विभ्राजमानैश्च तथा प्रदीपैः ॥
किरीटिवित्रासितसर्वयोधा । चक्रे निवेशं ध्वजिनी कुरूणाम् ॥ १३९ ॥[136]

(The army of the Kurus entered their camp with the help of torches and lights.)

These statements conflict with Mr. Karandikar's theory. He will say that even the moonlight was insufficient and therefore we have such descriptions. Well then, can we not say the same about the night of the 14th day?

240. Mr. Karandikar lays much stress on the wording द्विगुणं तमः (double darkness) in a passage[137] and says that this can be explained only by supposing that it was a dark night. Our reply is that the moonlit-night is a night after all and can be regarded as dark, as compared with the day and that the darkness of the moonlit-night and of the dust can be described as double darkness.

241. We may suggest here that the interpolation of the description of the moonrise was probably provoked by the incorrect reading of "चत्वारिंशाद्दिनान्यद्य द्वे च मे निःसृतस्य वै" etc. The interpolator appears to have thought that consistently with that reading, the Moon must rise on that particular day after midnight while the fight was going on and that the deficiency in the book ought to be made good by interpolating the description of the moonrise. He saw no impropriety in doing this as he appears to have thought that the moonrise was a fact.

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[136] *Bhīshma Parva*, Chapter 59.

[137] *Souptika Parva*, Chapter 8, verse 97. The verse is as follows:—

तैस्तत्रपरिधावद्भिः चरणोदीरितं रजः ।
अकरोच्छिबिरे तेषां रजन्यां द्विगुणं तमः ॥ ९७ ॥

[*Translation.*—"The dust raised by the feet of those men running here and there, created double darkness in the night, in their camp."]

242. After all this discussion, we can put the problem of the date of the Mahābhārata War in a nut-shell. Shall we reject the only year and the *Tithi* that we have calculated from indisputable astronomical statements and that satisfies all the conditions except this moon-rise which can fairly be inferred to be an interpolation? Any reasonable man will hold the moonrise to be an interpolation and accept the year and the *Tithi*.

LECTURE III

THE SYSTEM OF ANCIENT CHRONOLOGY

LECTURE III

THE SYSTEM OF ANCIENT CHRONOLOGY

OR

The Year, the Cycles, the Kalpa, the Manvantara
The Date of Śree Rāma

243. In the previous Lecture, we have determined the date of the Mahābhārata War to be 1197 B.C. We have not however, considered a very important objection to this date. The objection is as follows:—

It is stated in the verse

अंतरे चैव संप्राप्ते कलिद्वापरयोरभूत् ।
समंतपंचके युद्धं कुरुपांडवसेनयोः ॥ १३ ॥[1]

that the War was fought in the interim between the Dwāpara Yuga and the Kali Yuga. It is also stated in the verse

प्राप्तं कलियुगं विद्धि ॥ २५ ॥[2]

said by Śree Kṛishṇa to Balarāma on the 18th day of the War, that the Kali Yuga had already started. Again, it is stated in the verse

एतत्कलियुगंनाम अचिराद् यत्प्रवर्तते ॥ ३८ ॥[3]

said by Māruti to Bhīma that the Kali Yuga was to begin very soon. This talk between Māruti and Bhīma took place just before Arjuna returned from Indra's abode; and the Pāṇḍavas had completed six years of their exile when Arjuna returned from Indra's abode. This is proved by the verse

समेत्य पार्थेन यथैकरात्रं । ऊषुः समास्तत्र तदा चतस्रः ॥
पूर्वाश्चषट् ता दश पांडवानां । शिवा बभूवुर्वसतां वनेषु ॥ ५ ॥[4]

[*Translation.*—"They lived there for four years after Arjuna had joined them and they had formerly passed six

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[1] *Ādi Parva*, Chapter 2.
[2] *Śalya Parva*, Chapter 60.
[3] *Vana Parva*, Chapter 149.
[4] *Ibid.*, Chapter 176.

years before that event. Thus they passed ten years in the forest."]

This proves that the talk between Māruti and Bhīma took place about six years from the beginning of the exile. The War was fought after thirteen years from the beginning of the exile. It follows that the talk between Māruti and Bhīma must have taken place just about seven years before the War and that, therefore, the Kali Yuga must have begun within seven years before the War. The astronomical works say that Kali Yuga began when all the planets were in conjunction in the Revatī in the year 3102 B.C. Therefore, the argument is that the date of the War must be within seven years after 3102 B.C.

244. We have to explain this objection and we cannot do it without a thorough study of the Yugas.

245. Our date of the Mahābhārata War, *i.e.*, 1197 B.C. having been obtained from astronomical evidence is so certain that we must hold that the Kali Yuga referred to in the *Mahābhārata* must have started within seven years before 1197 B.C. and must be different from the Astronomical Kali, which is said to have begun in 3102 B.C.

246. This is confirmed by the following considerations also.

1. The planets were in or near the end of the Revatī at the beginning of the astronomical Kali while they were near the Mūla at the time of the War as already shown.

2. We can find no date within seven years after the beginning of the astronomical Kali, that gives the planetary positions mentioned in the *Mahābhārata* either in the first group or the second group. This is clear from the possible years calculated in the previous lecture.[5] It is, therefore, quite clear that the *Mahābhārata* Kali and the Astronomical Kali must be quite different things.

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[5] See *supra*, paragraphs 91, 92 and 93 (last sub-para).

247. This conclusion is supported by the fact that we actually find in the Vedas and the *Mahābhārata* mention of two systems of Yugas, the Mānusha or the Human and the Daiva or the Divine.

The following are the statements about the Divine Yugas and the Human Yugas:—

देवानां पूर्व्ये युगे असतः सदजायत ॥ २ ॥ ऋग्वेद, मं. १०, सू. ७२.

ततो देवेयुगेऽतीते देवावै समकल्पयन् ।
यज्ञं वेदप्रमाणेन विधिवद्यष्टुमीप्सवः ॥ १ ॥ महाभारत, सौ.अ. १८.

तदूचुषे मानुषेमा युगानि कीर्तेन्यं मघवा नाम बिभ्रत् ॥ ४ ॥
ऋग्वेद, मं. १, सू. १०३.

विश्वे ये मानुषा युगा पांति मर्त्यं रिषः ॥ ऋग्वेद, मं. ५, सू. ५२.

In these statements the word Yuga (युग) is qualified either by the word दैव (Divine) or by the word मानुष (Human). These statements, thus clearly show that there were two kinds of Yugas, the Divine and the Human.

248. The Divine Yugas must be comparatively much longer than the Human Yugas and cannot be made use of in historical narratives; for, they give no idea of time. Supposing that the present Astronomical Yugas are the same as the Divine Yugas, it is clear that their use in History will give us no idea of time. To say, for instance, that Śree Rāma lived in the Tretā Yuga of 12,96,000 years seems hardly intelligible. For giving us an idea of the time of historical events, the long Divine Yugas would be useless ; the smaller Human Yugas only can give us some idea of the time of the occurrence of events. It follows that the Yugas mentioned in the statements in the *Mahābhārata* just referred to and those referred to in other historical works also must be the Human Yugas, hereafter named also Historical Yugas and not the long Divine or Astronomical Yugas.

249. We must, therefore, study the Human Yugas. This is the main subject of this chapter.

250. We must meet here a preliminary objection. The late Mr. S. B. Dixit held that the dimensions of the Yugas were already settled before the Astronomical Siddhāntas came into existence; but that their starting point was not so settled and was probably calculated by the authors of Astronomical Siddhāntas assuming it to be the day of the conjunction of all planets.[6] The late Mr. C. V. Vaidya follows him and holds further that there was no Era in use in Ancient India.[7] Our attempt to study the Yugas would, therefore, be futile from the standpoint of these learned authors. We must meet this objection before we proceed further.

251. These authors have not seen clearly that there were two systems of Yugas and that they must be considered separately. They have not seen that there is clear evidence of the existence of some system of Yugas in times previous to the Bhārata War. The statements from the *Bhārata* just referred to, show that the dimensions and the starting point of the Yugas was then well known; for, otherwise they could not have said that the Kali was soon to begin or that it had just begun." The statements in Chapter 98, verses 88–93 of the *Vāyu Purāṇa* referred to hereafter[8a] show the same. These statements could not have been made without the existence of an Era, *i.e.*, the system of Yugas. Any statement that a certain event happened in a certain Yuga and in a certain subdivision of the same cannot be made unless the dimensions and the starting point are settled; and we have a number of such statements about very many ancient events as the reader would see hereafter. This proves that some system of Yugas which was used for narrating history was in existence in very ancient times. The starting point of this system could not have been a calculated one; for such a calculation was not necessary and was impossible in those ancient times on account of the undeveloped condition of

[6] See *Bhārateeya Jyotishśāstra*, page 143.
[7] *History of Sanskrit Literature*, pp. 2-4, in Section I.
[8a] See *infra*, paragraph 278.

Mathematics and Astronomy. Moreover an Era can be started from any event actually seen. Therefore, the existence in ancient times of an Era, *i.e.*, a system of Yugas, is beyond doubt. We shall study the various aspects of this system in the following sections.

SECTION A

252. Before studying the dimensions of the Yugas we must know the length of the year of the ancient Āryas in India. To the ancient Indian Āryas, the year was equivalent to the round of the seasons; they could not observe the sidereal revolutions of the Sun; they could only observe the round of the seasons and therefore, they regarded the round of the seasons as the year. This is clear from the following statement:—

संवत्सर एषोऽग्निर्ऋतवः शिक्यं ।
ऋतुभिर्हि संवत्सरः शक्नोति स्थातुं ॥
यच्छक्नोति तस्माच्छिक्यं ।
ऋतुभिरेवैनं बिभर्ति ॥[8]

[*Translation.*—" The year is the fire and the seasons are the sling (for holding it): for, the year can stand by the help of the seasons. By the seasons only does (one) support the year. The word Śikya (शिक्यं) (sling) is derived from Śak, which means 'to be able'. The seasons are, therefore, called Śikya (शिक्यं) because they are able to support the year."]

षड्वा ऋतवः संवत्सरः । ऋतुष्वेव संवत्सरे प्रतितिष्ठंति ॥[9]

[*Translation.*—" The six seasons constitute the year. They (men) stand in the year by standing in the seasons."]

253. This shows that the year was taken to be equal to the round of the seasons. The round of the seasons approximately is equal to 365¼ days as is well known. But we find

[8] *Śatapatha Brāhmaṇa*, 6. 7. 1. 18.
[9] *Taittirīya Saṃhitā*, 7. 5. 1.

in the following statements that one year was taken to be equal to 360 days:—

षड्रात्रीर्दीक्षितः स्यात् षड् वा ऋतवः संवत्सरः ।
द्वादश रात्रीर्दीक्षितः स्यात् द्वादश मासाः संवत्सरः ॥
त्रयोदश रात्रीर्दीक्षितः स्यात् त्रयोदश मासाः संवत्सरः ।
पंचदश रात्रीर्दीक्षितः स्यात् पंचदश वा अर्धमासस्य रात्रयः ॥[10]

[*Translation.*—One should perform sacrifice for 6 days for six are the seasons of the year. One should perform sacrifice for 12 days for twelve are the months of the year. One should perform sacrifice for 13 days for thirteen are the months of the year. One should perform sacrifice for 15 days for fifteen are the nights of half the month."

तस्य च त्रीणि च शतानि षष्टिश्च स्तोत्रीयाः तावतीः संवत्सरस्य रात्रयः ।[11]

[*Translation.*—" He has got 360 Stotrīyas, for so many are the nights of one year."]

संवत्सरो वै प्रजापतिरग्निः । तस्य वा एतस्य संवत्सरस्य प्रजापतेः सप्त च शतानि विंशतिश्चाहोरात्राणि ॥[12]

[*Translation.*—The year is the Prajāpati or the Fire. This Prajāpati has got seven hundred and twenty days and nights taken together."]

254. This shows that the year was taken to be equal to 360 days of 12 months each, a month being equal to thirty days. But this is not equivalent to the real length of the round of the seasons, *i.e.*, 365¼ days. By taking a year to be equal to 360 days only, the seasons would advance 5¼ days every year. They would thus advance 21 days in four years or 31½ days in six years. Such an advance can easily be detected in at least twenty years and the ancients could not have been ignorant of the same. It is therefore that the year is also said to consist of thirteen months. This means that though the ordinary year was taken to consist of

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[10] *Taittirīya Samhita*, 5, 6, 7.
[11] *Ibid.*, 7, 5, 1.
Śatapatha Brāhmaṇa, 10. 4. 2.

12 months or 360 days an extraordinary year was taken to consist of thirteen months.

255. What then was the length of this thirteenth month and when was it taken are the questions to be answered. The answer is that the thirteenth month consisted of twenty-one days and that it was taken in every fourth year.

256. The following is the evidence for this answer.

In the *Śatapatha Brāhmaṇa*, the Yūpas in the Aśvamedha Yajña are described in the following manner.

एकविंशतिर्यूपाः । सर्व एकविंशत्यरत्नयो राज्जुदालोऽग्निष्ठो भवति पैतुदारवावभितः षड्बैल्वास्त्रय इत्थात्त्रय इत्थात् षद् खादिरास्त्रय एवेत्थात्त्रय इत्थात् षट पालाशास्त्रय एवेत्थात्त्रय इत्थात् ॥ ५ ॥ तद्येदत एवं यूपा भवंति । प्रजापतेः प्राणेषूत्क्रांतेषु शरीरं श्वयितुमध्रियत तस्य यः श्लेष्मासीत् स सार्धं समवहुत्य मध्यतो नस्त उदभिनत्स एष वनस्पतिरभवद्रज्जुदाल" इत्यादि[13]

[*Translation.*—There are twenty-one Yūpas and twenty-one Cords, all told. There is one Yūpa made of Rajjudāla in the place of the Fire. There are two Yūpas of Pītudāru on two sides of the Fire. There are six Yūpas of Bilva, three being here (on this side of the Fire) and three being here (on the other side of the Fire). There are six Yūpas of Khadira, three being here (on this side of the Fire) and three being here (on the other side of the Fire). There are six Yūpas of Palāśa, the three being here (on one side of the Fire) and three being here (on the other side of the Fire): These Yūpas are produced in this manner. When Prajāpati (*i.e.*, the year, as stated in a passage previously cited) died, his body was kept up to increase (श्वयितुं). His Phlegm came out of his nose and became the tree, named Rajjudāla. His watery lustre (essence) came out of his eyes and became the tree named Pītudāru. His fat came out of his ears and became the tree named Bilva. His bones gave birth to the tree named Khadira and his flesh gave birth to the tree named Palāśa.]

[13] *Śatapatha Brāhmaṇa*, 13. 4. 4.

257. It is clear from this that in some year, the civil year, of 360 days, was kept up by adding some intercalary days, and that the twenty-one Yūpas represented those days. Whether one Yūpa represented one intercalary day is the question. The number twenty-one suggests the answer. For, we cannot get the number twenty-one without supposing that intercalary days were added in the fourth year. If the civil year is equal to 360 days, it is short by 5¼ days. This shortness amounts to 21 days in four years and therefore, 21 days are required to be intercalated in the fourth year. We do not get this number twenty-one in any other way. Therefore, the twenty-one Yūpas must be taken to represent twenty-one intercalary days. Hence, though the ordinary year amounted to 360 days, every fourth year was taken to be made of 381 days. The thirteenth month was thus taken every fourth year and consisted of twenty-one days.

258. This is supported by the fact that in the following passages the *Śatapatha Brāhmaṇa* tells the names of three hundred and eighty-one days of the year, which could be no other than the long year:—

श्रद्धाया वै देवाः । दीक्षां निरमिमतादित्यै प्रायणीयं सोमात्क्रयं विष्णोरातिथ्यमादित्यात्प्रवर्ग्यं स्वधाया उपसदोऽग्निषोमाभ्यामुपवसथमस्माल्लोकात्प्रायणीयमतिरात्रं ॥१॥ संवत्सराच्चतुर्विंशमहः । ब्रह्मणोऽभिप्लवं क्षत्रात्पृष्ठ्यं अग्नेरभिजित् अद्भ्यः स्वरसामानः आदित्याद्विषुवंतं उक्ताःस्वरसामानः इंद्राद्विश्वजितं उक्तौ पृष्ठ्याभिप्लवौ मित्रावरुणाभ्यां गोऽऽआयुषी विश्वेभ्यो देवेभ्योदशरात्रं दिग्भ्योदशरात्रिकं पृष्ठ्यं षडहं एभ्यो लोकेभ्यश्छंदोमान् ॥ २ ॥ संवत्सराद्दशममहः प्रजापतेर्महाव्रतम् स्वर्गाल्लोकादुदयनीयमतिरात्रंतदेतत् संवत्सरस्य जन्म वेद हास्माच्छ्रेयान् जायते सात्मा भवति संवत्सरो भवति संवत्सरो भूत्वा देवानप्येति ॥ ३ ॥[14]

[*Translation.*—"The Gods created the day named:—

(1) Deeksha	(दीक्षा)	from Śraddhā	(श्रद्धा)
(2) Prāyaṇīya	(प्रायणीय)	,, Aditi	(अदिति)
(3) Kraya	(क्रय)	,, Soma	(सोम)
(4) Ātithya	(आतिथ्य)	,, Vishṇu	(विष्णु)

[14] *Śathapatha Brāhmaṇa*, Kāṇḍa 12, Chapter I, Brāhmaṇa 2.

(5) Pravargya	(प्रवर्ग्य)	from	Āditya	(आदित्य)
(6) Upasadaḥ	(उपसद:)	,,	Swadhā	(स्वधा)
(7) Upavasatha	(उपवसथ)	,,	Agnishoma	(अग्निषोम)
(8) Prāyaṇeeya Atirātra	(प्रायणीय अतिरात्र)	,,	this World	(अस्माल्लोकात्)
(9) Chaturvinśa day	(चतुर्विंशमह:)	,,	Samvatsara	(संवत्सर)
(10) Abhiplava	(अभिप्लव)	,,	Brāhmaṇas	(ब्रह्म)
(11) Pṛishṭhya	(पृष्ठ्य)	,,	Kshatriyas	(क्षत्र)
(12) Abhijit	(अभिजित्)	,,	Agni	(अग्नि)
(13) Svarasāmans	(स्वरसामान:)	,,	Water	(अद्भ्य:)
(14) Vishuvān	(विषुवान्)	,,	Āditya	(आदित्य)
(15) Svarasāmans	(स्वरसामान:)	,,	Water as already told	(अद्भ्य:)
(16) Viśvajit	(विश्वजित्)	,,	Indra	(इंद्र)
(17) Pṛishṭhya	(पृष्ठ्य)	,,	Kshatriyas as already told	(क्षत्र)
(18) Abhiplava	(अभिप्लव)	,,	Brāhmaṇas as already told	(ब्रह्म)
(19) Go and	(गो)	,,	Mitrāvaruṇa	(मित्रावरुणौ)
(20) Āyus	(आयुस्)			
(21) Daśarātra	(दशरात्र)	,,	Viśvedevas	(विश्वेदेवा:)
(22) Daśarātrika Pṛishṭhya Shaḍaha	(दशरात्रिक पृष्ठ्यषडह)	,,	Diśas	(दिश:)
(23) Chhandomās	(छंदोमा:)	,,	Lokas	(लोका:)
(24) Tenth day (Daśama)	(दशममह:)	,,	Samvatsara	(संवत्सर:)
(25) Mahāvrata	(महाव्रत)	,,	Prajāpati	(प्रजापति)
(26) Udayaneeya Atirātra	(उदयनीय अतिरात्र)	,,	Samvatsara	(संवत्सर)

He who knows this birth of the year (संवत्सर) becomes great, becomes high-souled, becomes the year and goes to the Gods."

259. A second list also is given in the 4th Brāhmaṇa of the same chapter of the same Kāṇḍa where the year is described as analogous to the human body. In this list, however, the first seven items and the items (22), (23) and (24) have been omitted.

260. The following passage also is very important:

संवत्सरस्य समता वेदितव्या एकं पुरस्ताद्विषुवतोऽतिरात्रमुपयंत्येकमुपरिष्टात्-त्रयः पंचाशतं पुरस्ताद्विषुवतोऽग्निष्टोमान् उपयन्ति त्रयः पंचाशदुपरिष्टात् विंशतिशतं पुरस्ताद्विषुवत उक्थ्यान्यहान्युपयन्ति विंशतिशतमुपरिष्टात् इति नु य उक्थ्यान्स्वर-सामन्नउपयंति ॥ १२ ॥ अथ येऽग्निष्टोमान् षट्पंचाशतं पुरस्ताद्विषुवतोऽग्निष्टोमानुपयंति षट्पंचाशतमुपरिष्टात् सप्तदशशतं पुरस्ताद्विषुवत उक्थ्यान्यहान्युपयंति सप्तदशशतं उपरिष्टात् षट्पुरस्ताद्विषुवतः षोडशिनः उपयंति षडुपरिष्टात् त्रिंशतं पुरस्तात् विषुवतः षडहान्युपयंति त्रिंशतमुपरिष्टात् एषाहास्य समता ॥ १३ ॥[15]

[*Translation.*—"The year has symmetry. There is an Atirātra on both sides of the Vishuvān. There are fifty-three Agnishṭomas and 120 Ukthyas on both sides of the Vishuvān in the calculation of those who take the Svarasāmans as Ukthyas. But in the calculation of those who take the Svara-sāmans as Agnishṭomas there are fifty-six Agnisṭhomas and 117 Ukthyas on both the sides of Vishuvān.[16] There are six Shoḍaśins on both sides of the Vishuvān. Thus there are thirty Shaḍahas (groups of six days) on both sides of the Vishuvān."]

This passage shows that the year consisted of 360 days with one Vishuvān in the middle, *i.e.*, 361 days.

261. Does this description apply to the first list or to the second? The question is very important. The number of the days in the first list exceeds those in the second by the days of items (1), (2), (3), (4), (5), (6), (7), (22), (23) and (24). The items (22), (23) and (24) amount to ten days; for Prishthya Shaḍaha is equal to six days, being a group of six days and Chhandomas are three in number. [The Chhandomas are three in number because they have been created from Lokas and Lokas are said to be three in *Śatapatha Brāhmaṇa*, Kāṇḍa 12, Chapter 2, Brāhmaṇa 2, and because in तस्य यः पृष्ठ्यः षडहः ऋतव स इमे लोकाश्छंदोमाः ॥[17] they (Chhandomas) have been said to be Lokas (which are three) just as Shaḍaha of six days is said to be the seasons which are six. Moreover

[15] *Śatapatha Brāhmaṇa*, Kāṇḍa 12, Adhyāya 3, Brāhmaṇa 5.

[16] This shows that Svarasāmans are three in number.

[17] *Śatapatha Brāhmaṇa*, Kāṇḍa 12, Chapter 2, Brāhmaṇa 3.

the very fact that item (24) is named the tenth day (दशममह) shows that Chhandomas are three: for then only with the six days of the previous item (22) named षडह (a group of six days) would they make nine and then only would the description of the following day as the tenth day be appropriate.] Now if the items (22), (23) and (24) coming after the विषुवान् (Vishuvān) and omitted in the 2nd list are equal to ten days, the items 1 to 7 coming before the Vishuvān and also omitted in the 2nd list must also be equal to ten days. This follows from the symmetry referred to in the above passage. It should be noted that the 6th item Upasadaḥ being in the plural number can be taken to be equal to 4 days and the 7 items together can then make ten days. The difference between the first and the second list is thus that of twenty days. Now if the second list amounts to 361 days the first list would amount to 381 days. But if the first be taken to amount to 361 days the second would amount to 341 days. But 361 or 341 days do not correspond to any actuality. Therefore it must be held that the year as represented by the first list consisted of 381 days.

262. Moreover, there is yet another reason to suppose that the passage about symmetry applies to the second list only. The days on each side of Vishuvān given in the second list are, like those in the passage about symmetry, divisible by six. This is not the case with the days enumerated in the first list. This is easily seen if we examine the second list carefully. In that list the Pṛishṭhyas and Abhiplavas[18] are

[18] That Pṛishṭhya and Abhiplava are each equal to six days is shown by the following passage also :—एष वा संवत्सरो बृहतीमभिसंपन्नः । द्वावाक्ष्येतामहां षडहौ द्वौ पृष्ठ्याभिप्लवौ गो आयुषी दशरात्रस्तत् षट्त्रिंशत् षट् त्रिंशदक्षरा वै बृहती ॥ १ ॥—*Śatapatha Brāhmaṇa*, Kāṇḍa, 12, Chapter 2, Brāhmaṇa 3.

[*Translation.*—" This year is equivalent to a Bṛihatī; for two Shaḍahas (a group of six days) of praying days, the two named Pṛishṭhya and Abhiplava. Go, Ayus and Daśarātra (name of a group of ten days) make thirty-six days and so many are the letters of the Bṛihatī ".] Here we get the addition of 36 only if Pṛishṭhya is six days and Abhiplava is six days. Moreover in *Śatapatha Brāhmaṇa*, Kāṇḍa 12, Chapter 1, Brāhmaṇa 3, अभिप्लव and पृष्ठ्य are expressly called षडह, in " अथ यदभिप्लवं षडह मुपयंति...... ॥ १० ॥ and in " अथ यत्पृष्ठ्यं षडहमुपयंति " ॥ ११ ॥

Shaḍahas and are divisible by six: items (8), (9), (12) and (13) make 6 days (for Svarasāmans are three as is well known and is clear from the passage about symmetry); on the other side of Vishuvān also items (15), (16), (19) and (20) make 6 days; Items (21), (25) and (26) make 12 days. Thus the days on both sides of Vishuvān in the 2nd list are divisible by six; the days in first list exceeding by ten cannot be divisible by six. Therefore it follows that the passage about symmetry applies to second list only and cannot apply to the first list. The number of days in the second list has thus to be taken to be 361 and that in first list 381.

263. We thus reach the conclusion that the Vedic Calendar consisted of three years of 360 days and one long year of 381 days. We shall henceforth name this year of 381 days as the "long year" or the "fourth year".

SECTION B

264. The Aśwamedha was performd in the "long year". This is proved very clearly by the following passages in the *Śatapahta Brāhmaṇa :*

प्रजापति रकामयत् महान् भूयान् स्यामिति स एतावश्वमेधे महिमानौ ग्रहाव-पश्यत् तावजुहोत् ततो वै स महान् भूयानभवत् ॥ १ ॥[19]

[*Translation.*—" Prajāpati (*i.e.*, the year) desired that he should be great (long); he saw in Aśwamedha two Grahas that could lengthen him.[20] He offered oblations to them and thereby he became great (long)."]

This is only a poetical description of the fact that the Aśwamedha was performed in the 'long year'.

प्रजापतेरक्ष्यश्वयत् तत्परापतत्ततोश्वः समभवत् तदश्वस्याश्वत्वं तद्देवा अश्वमेधे-नैव प्रत्यदधुरेष वै प्रजापतिं सर्वं करोति योश्वमेधेन यजते ॥[21]

[19] Kāṇḍa 13, Chapter 2, Brāhmaṇa 11.

[20] Kāṇḍa 13, Chapter 3, Brāhmaṇa 1.

[21] This is the meaning of महिमान. It has a similar meaning in "अजान गर्भं महिमानमिद्रं" (*Taittiriya Samhitā*, Ashṭaka 4, Prapāṭhaka 3, Anuvāka 11.).

[*Translation.*—The eye of the Prajāpati increased (grew); (while growing) it fell away. From it a horse came into being. A horse is called Aśwa, because it grew Aśwayat (अश्वयत्). That (the eye) the Gods set again in its place by the Aśwamedha, itself. Therfore he who sacrifices by the Aśwamedha, *i.e.*, performs the Aśwamedha sacrifice, makes the Prajāpati complete."]

Here the eye of the Prajāpati can mean nothing but the difference between the civil year of 360 days and the solar year of 365¼ days. This difference increased (अश्वयत्) every year till in the 4th year it amounted to twenty-one whole days—an integral number of days convenient for intercalation. This fact is described as the falling away of the eye. That 'this eye was set in its place again by the Aśwamedha' means that this difference was filled in by performing the Aśwamedha during the whole period of the long year. Thus it is clear that the Aśwamedha was performed in the "long year".

SECTION C

265. We shall now see that the period of four years ending with the "long year", was called a Yuga. We have the following important statements

(*a*) चतुर्युगानि राजात्र त्रयोदश स पार्थिवः ॥ ४५ ॥[22]

[*Translation.*—"The King (*i.e.*, Rāvaṇa) ruled here for thirteen Chatur-Yugas."]

Here Chatur-Yuga can only mean a Yuga of four years. For a man's life does not much exceed 100 years and therefore 13 Chatur-Yugas must be a number less than 100 years and must be held to be equal to 52 years. If by Chatur-Yuga we understand, the Kali, the Dwāpara, the Tretā, and the Kṛita together, the rule of Rāvaṇa would be irrationally long. This proves that there was a Yuga of four, of course, of four years. The word Yuga generally means any period in which

[22] *Vāyu Purāṇa*, Chapter 70.

the same thing happens again. One year is thus a Yuga as the seasons happen again in one year. The period of four years would also be a Yuga as the "long year" recurs at its end. And we have just seen that "Chatur-Yuga" can only mean a period of four years.

(*b*) दीर्घतमा मामतेयोजुजुर्वान् दशमे युगे ॥[23]

[*Translation.*—" Dīrghatmas, the son of Mamatā, became old in the tenth Yuga."] Here also a Yuga must be construed to mean a period of a few years; for ten Yugas must be a period less than 100 years. This supports our conclusion from the passage (*a*) above that a Yuga was then in vogue consisting of 4 years.

266. In the *Vedānga-Jyotisha* the period of five years is called a Yuga in the verse,

माघशुक्लप्रपन्नस्य पौषकृष्णसमापिनः ।
युगस्य पंचवर्षस्य कालज्ञानं प्रचक्षते ॥ ३२ ॥[24]

[*Translation.*—" The method of knowing time of the Yuga of five years beginning with the bright half of Māgha and ending with the dark half of Pausha, is told (here), and five lords of the five years are mentioned."] In the *Taittirīya Brāhmaṇa* (1. 4. 10), however, only four years and their four lords are mentioned. This shows that before the Yuga of five years was introduced by the *Vedānga-Jyotisha*, a Yuga of four years was in vogue. The *Vāyu Purāṇa* also says in

संवत्सराद्यः पंच चतुर्मानविकल्पिताः ॥ १८२ ॥[25]

[that " the five years beginning with Samvatsara were obtained by the modification of four years."]

It is thus evident that in days before the *Vedānga-Jyotisha* " Yuga " could only have meant four years.

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[23] *Rigveda*, 1. 158. 6.

[24] *Yajurvedānga-Jyotisha*.

[25] *Vāyu Purāṇa*, Chapter 50.

267. The following calculation also supports the same proposition :—

अष्टाविंशद्युगाख्यास्तु गता वैवस्वतेंऽतरे ।
एता राजर्षिभिः सार्धं शिष्टा यास्ता निबोधत ॥ ४५७ ॥
चत्वारिंशत्त्रयेचैव भविष्याः सह राजाभिः ।[26]
युगाख्यानां विशिष्टास्तु ततोवैवस्वतक्षये ॥ ४६० ॥

[*Translation.*—"In the period of the Vaivasvata Manu, 28 Yugas have elapsed and 40 Yugas are to elapse."] This means that the period of the Vaivasvata Manu was 68 Yugas. The period of the Chākshusha Manu was also of 68 Yugas, as appears from the passage :—

वैवस्वतेन संख्यातः तस्य सर्गोमहात्मनः ।
विस्तरेणानुपूर्व्याच.... ॥६७ ॥[27]

[*Translation.*—"The creation of that great Soul (the Chākshusha Manu) is measured as regards the length and the number in the series of descedants (आनुपूर्वी) by those of Vaivasvata Manu], which means that the period of the Chākshusha Manu was equal in length to that of the Vaivasvata Manu, *i.e.*, 68 Yugas.

Now the Vaivasvata Manu is the 12th descedant of the Chākshusha Manu[28] and one generation is approximately equal to 22 years. Therefore one Yuga $= \frac{22 \times 12}{68} = 4$ years in round numbers.

268. All this shows clearly that the word Yuga was used for a period of four years. Now, the year, the Yuga of four years and the Era must have begun simultaneously and the first three years of the Era must naturally have been the ordinary years of 360 days and the fourth year must have been of 381 days. Thus it is clear that the first Yuga ended with the long year of 381 days and of course, the subsequent

[26] Chapter 99 of *Vāyu Purāṇa*.
[27] *Vāyu Purāṇa*, Chapter 62.
[28] See Lecture IV, paragraphs 367 and 376.

Yugas and thus every Yuga ended with the long year. Henceforth we shall designate this Yuga of four years ending with the 'long year' by the word 'quaternary'.

SECTION D

269. New Ṛik, Yajush and Saman Mantras (ऋग्, यजुष्, सामन्) were made for the Aśwamedha every fourth year. the period of four years being also called a Manvantara.

270. This is proved by the following passage in *Śatapatha Brāhmaṇa* :—

संवत्सरो वै प्रजापतिरग्निः । ....स ऋचो व्यौहत् द्वादश बृहतीसहस्राण्येतावत्यो हर्चो याः प्रजापतिसृष्टाः .... ॥ २३ ॥ अथेतरौ वेदौ व्यौहत् द्वादशैव बृहतीसहस्राण्यष्टौ यजुषां चत्वारि साम्नाम् एतावद्धैतयोर्वेदयोर्यत्प्रजापतिसृष्टं........ ॥ २४ ॥[29]

[*Translation.*—" Year is the Prajāpati who is also the Agni (Sacrifice). He arranged the Ṛig Veda into twelve thousand Bṛihatīs; for only so many are the Ṛik hymns created by the Prajāpati..... He then arranged the other two Vedas into twelve thousand Bṛihatīs; the Yajur Veda into eight thousand Bṛihatīs and the Sama Veda into four thousand Bṛihatīs. For so many only are the hymns of these Vedas created by the Prajāpati."]

271. This clearly states that the hymns of all the Vedas were created by the Prajāpati, *i.e.*, the year. This only means in non-poetical language that hymns were made at a regular interval of years. We also know that the Aśwamedha was performed every 'fourth year' to make the Prajāpati or year complete. These two facts combined together, show that the Prajāpati is said to have created hymns because they were made for the Aśwamedha that was performed for completing the Prajāpati and therefore that hymns were made every 'fourth year' for the Aśwamedha performed every fourth year to complete the year.

[29] Kāṇḍa 10, Chapter 4, Brāhmaṇa 2.

272. This conclusion is supported by the following statements in the Purāṇas :—

(*a*) प्रतिमन्वंतरं चैव श्रुतिरन्याविधीयते ।
ऋचो यजूंषि सामानि यथावत्प्रतिदैवतम् ॥ ५७ ॥[30]

[*Translation.*—" New Vedas are made in every Manvantara, namely Ṛik, Yajush and Saman for every deity."]

This passaage alone proves that new hymns were made in every Manvantara.

(*b*) मन्वंतरे परावृत्ते स्थानान्युत्सृज्य सर्वशः ।
मंत्रैः सहार्ध्वं गच्छंति महर्लोकमनामयं ॥ १६९ ॥[31]

[*Translation.*—" When the Manvantara is finished (the Ṛishis and Manus) abandon their offices and go up to the happy Maharloka with the Mantras."]

This clearly means that the hymns in the old Manvantara could not be used in new Manvantara and that, therefore, new mantras had to be composed in every Manvantara.

273. There is further evidence to support this conclusion. In the first list of the days of the " long year " given by us already there are three days named Chhandomas (item No. 23). The word Chhandoma (छंदासि मीयंते वा निर्मीयंते येषु ते दिवसाः) means those days in which the hymns are composed or measured to see if the prescribed length of hymns is composed. Though we do not find in the Brāhmaṇas of to-day, such an act of composing or measuring hymns, the derivation of the word Chhandoma is itself so very certain that it can point to no other conclusion than that new hymns were composed every ' long year '.

274. The following passage also confirms this conclusion :—

युगे युगे विदथ्यं गृणद्भ्यो रयिं यशसं धेहि नव्यसीम् ।[32]

[30] *Vāyu Purāṇa*, Chapter 59; *Matsya Purāṇa*, Chapter 145.
[31] *Vāyu Purāṇa*, Chapter 61.
[32] *Rigveda*, Maṇḍala 6, Sūkta 8.

[*Translation.*—" Give wealth useful for Yajña and fame to us, who sing new praises to you in every Yuga."] As a Yuga has been shown to be equal to four years this means that new Ṛik, Yajush and Saman were composed every fourth year (for Aśwamedha, of course). Incidentally this passage also shows that the Manvantara was the same thing as a Yuga, *i.e.*, a period of four years.

Section E

275. We will now consider the meaning of the Kali Yuga, the Dwāpara Yuga, the Tretā Yuga, and the Kṛita Yuga. Here we have to consider two points (*a*) their dimensions, (*b*) their starting point. We will take up the former here and the latter afterwards.

276. In the *Vāyu Purāṇa* we find the following important passage :—

कृतं त्रेता द्वापरं च युगादिः कलिना सह ।
परिवर्तमानैस्तैरेवं भ्रममाणेषु चक्रवत् ॥ ७ ॥
देवतास्तु तदोद्विग्नाः कालस्य वशमागताः ।
न शक्नुवंति तन्मानं संस्थापयितुमात्मना ॥ ८ ॥
तदा ते वाग्यताभूत्वा आदौ मन्वंतरस्य ह ।
ऋषयश्चैव देवाश्च इंद्रश्चैव महातपाः ॥ ९ ॥
समाधाय मनस्तीव्रं सहस्रं परिवत्सरान् ।
प्रपन्नास्ते महादेवं भीताः कालस्य वै तदा ॥ १० ॥
अयं हि कालो देवेशश्चतुर्मूर्तिश्चतुर्मुखः ।
कोस्य विद्यान्महादेव अगाधस्य महेश्वर ॥ ११ ॥
अथ दृष्ट्वा महादेवस्तं तु कालं चतुर्मुखम् ।
न भेतव्यमिति प्राह को वः कामः प्रदीयताम् ॥ १२ ॥
उवाच देवो भगवान् स्वयं कालः सुदुर्जयः ॥ १३ ॥
यदेतस्य मुखं श्वेतं चतुर्जिह्वं हि लक्ष्यते ।
एतत्कृतयुगं नाम तस्य कालस्य वै मुखम् ॥ १४ ॥
यदेतद्रक्तवर्णाभं द्वितीयं वः स्मृतं मया ।
त्रिजिह्वं लेलिहानं तु एतत्त्रेतायुगं द्विजाः ॥ १५ ॥

यदेतद्वै मुखं भीमं द्विजिह्वं रक्तपिंगलम् ।
द्विपादोऽत्र भविष्यामि द्वापरं नाम तद्युगम् ॥ १७ ॥
यदेतत्कृष्णवर्णाभं तुरीयं रक्तलोचनम् ।
एकजिह्वं पृथुश्यामं लेलिहानं पुनःपुनः ॥ १८ ॥
ततः कलियुगं घोरं सर्वलोकभयंकरम् ।
कल्पस्य तु मुखं ह्येतत् चतुर्थं नाम भीषणम् ॥ १९ ॥[33]

The substance of this passage is as follows:—

"As the four Yugas, the Kali, the Dwāpara, the Tretā and the Kṛita were revolving like a wheel, the Gods could not determine the dimensions of time (year). Therefore prior to the Manvantaras, they (Ṛishis, Devas and Indra) concentrated their mind for one thousand years and prayed (प्रपन्नाः) to Mahādeva and asked, 'Oh Lord, this time (of thousand years) has four heads and is composed of fours, *i.e.*, quaternaries (चतुर्मूर्तिः); who would know this time?' Mahādeva said, 'Its head named the Kṛita has four tongues, its head named the Tretā has three tongues, its head named the Dwāpara has two tongues and its head named the Kali has one tongue only. This is the fourth head of the Kalpa.'"

277. From the number of tongues of each Yuga, given in this passage, we know definitely that the dimension of the Dwāpara was twice that of the Kali, of the Tretā thrice, and of the Kṛita four times of that of the Kali. Here we may suggest that in the above passage "अयं कालः" (this time) has reference to and stands for सहस्रं परिवत्सरान् (one thousand years). If so it would follow from its description as Chaturmukha (having four heads), that all the four Yugas together make up a thousand years and that, therefore, the Kali Yuga is equal to one hundred years, the Dwāpara is equal to two hundred years, the Tretā to three hundred years, and the Kṛita to four hundred years. But since some may cast doubt on this

[33] *Vāyu Purāṇa*, Chapter 32.

interpretation, we proceed to prove the dimensions of the Yugas from other independent evidence.

278. In the *Vāyu Purāṇa* we have the following passage in Chapter 98 :—

एतास्तिस्रः स्मृतास्तस्य दिव्याः संभूतयः शुभाः ।
मानुष्याः सप्त यास्तस्य शापजास्तान्निबोधत ॥ ८८ ॥
त्रेतायुगे तु दशमे दत्तात्रेयो बभूव ह ।
धर्मे नष्टे चतुर्थश्च मार्कंडेयपुरःसरः ॥ ८९ ॥
पंचमः पंचदश्यां तु त्रेतायां संबभूव ह ।
मांधाता चक्रवर्ती तु तदोसंकपुरःसरः ॥ ९० ॥[34]
एकोनविंशे त्रेतायां सर्वक्षत्रांतकोऽभवत् ।
जामदग्न्यस्तथा षष्ठो विश्वामित्रपुरःसरः ॥ ९१ ॥
चतुर्विंशे युगे रामो वसिष्ठेन पुरोधसा ।
सप्तमो रावणस्यार्थे जज्ञे दशरथात्मजः ॥ ९२ ॥
अष्टमो द्वापरे विष्णुरष्टाविंशे पराशरात् ।
वेदव्यासस्ततो जज्ञे जातूकर्णपुरःसरः ॥ ९३ ॥

We have a similar passage in the *Matsya Purāṇa*, Chapter 47.

One who believes in the correctness of the dimensions of the Yugas given in Indian Astronomical works will render this passage as follows :—

"These three are said to be His divine incarnations. Now learn His seven human incarnations brought about by curse. The fourth incarnation named Dattātreya, was born in the Tretā of the tenth Mahāyuga. The fifth incarnation named Māndhātā was born in the Tretā of the fifteenth Mahāyuga. The sixth incarnation named Jāmadagnya (Rāma) was born in the Tretā of the nineteenth Mahāyuga. The seventh incarnation named Rāma, the son of Daśaratha, was born in the Tretā of the twenty-fourth Mahāyuga. The eighth incarnation named Vedavyāsa, son of Parāśara, was born in the Dwāpara of the twenty-eighth Mahāyuga."

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[34] This is the reading in the *Matsya Purāṇa*. The reading in the *Vāyu Purāṇa* is "मांधातुश्चक्रवर्तित्वे तस्थौ तथ्यपुरःसरः", but that reading has no meaning.

279. According to the Indian Astronomical works the Kali Yuga is equal to 432000 years, the Dwāpara Yuga is equal to 864000 years, the Tretā Yuga is equal to 1296000 years, the Kṛita Yuga is equal to 1728000 years and the Mahāyuga which is the combination of the Kali, the Dwāpara, the Tretā and the Kṛita, is' of course, equal to 4320000 years. On the basis of these dimensions and of the construction of the passage given above, the interval between Dāśarathi Rāma and Vedavyāsa would be equal to four Mahāyugas and one Tretā Yuga at least, *i.e.*, equal to 18576000 years, and the interval between Jāmadagnya Rāma and Dāśarathi Rāma would be five Mahāyugas, *i.e.*, 21600000 years nearly. We, however, know definitely that Bṛihadbala, a descendant of Dāśarathi Rāma, fought and was killed in the Mahābhārata War and that this Bṛihadbala was the 25th descendant of Dāśarathi Rāma, according to the *Bhāgavata Purāṇa*, 32nd descendant according to the *Vishṇu Purāṇa*, and the *Vāyu Purāṇa*. Vedavyāsa was the grandfather of the Pāṇḍavas who fought the Mahābhārata War. Therefore we will have to hold that 30 generations are equal to 18576000 years. In the same way since it is said that Jāmadagnya Rāma was a contemporary of Dāśarathi Rāma we will have to hold that Jāmadagnya Rāma lived for 21600000 years. Plainly these are impossibilities as we know that a generation is never greater than 25 years and that the span of a man's life does not much exceed 100 years. Even if we hold that a Mahāyuga is a combination of the Kali of hundred years, the Dwāpara of two hundred years, the Tretā of three hundred years and the Kṛita of four hundred years, *i.e.*, that a Mahāyuga is equal to 1000 years, we still get the interval between Dāśarathi Rāma and Vyāsa to be 4300 years and the life of Jāmadagnya Rāma to be 5000 years and 30 generation to be equal to 4300. These also are impossibilities. We are, therefore, constrained to construe the passage in another and a reasonable way, taking that the words tenth, fifteenth, nineteenth, twenty-fourth and twenty-eighth represent subdivisions of the Tretā and the Dwāpara, namely, the

quaternaries. This finds support in the fact that the word twenty-fourth (चतुर्विंशे) in the 92nd stanza qualifies the word Yuga (युगे) which as we have seen means a quaternary. The correct rendering of the passage is, therefore, as follows:—

"These are His three divine[35] incarnations. Now learn His seven human incarnations. The fourth incarnation named Dattātreya was born in the tenth quaternary of the Tretā; the fifth incarnation named Māndhātā was born in the fifteenth quaternary of the Tretā; the sixth incarnation named Jāmadagnya Rāma was born in the nineteenth quaternary of the Tretā; the seventh incarnation Dāśarathi Rāma was born in the twenty-fourth quaternary (of the Tretā); the ighth incarnation named Vedavyāsa was born in the 28th uaternary of the Dwāpara." From this true interpreta-on of the passage we can find the dimensions of the Dwāpara Yuga and others.

280. This passage says that Vedavyāsa was born in the 8th quaternary of the Dwāpara Yuga, *i.e.*, between 108 to 12 years from the beginning of the Dwāpara. We also know iat the fourth descendant of Vedavyāsa, named Parikshit, as born[36] just after the Mahābhārata War and that the Iahābhārata War was fought just after the beginning of the Kali.[37] Therefore taking one generation to be equal to 2 years, we get the Dwāpara Yuga to be equal to 108 + 22 × 4 the least or 112 + 22 × 4 in the greatest, *i.e.*, to 196 or 200 ars. The dimension of the Dwāpara must have been a und number. Therefore it follows that the Dwāpara is qual to 200 years and that the Kali is 100 years, the Tretā 00 years and the Kṛita 400 years.

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[35] The divine incarnations mean those born in the country of the Devas, *e.*, the ब्रह्मावर्त and the Human incarnations mean those born in other ountries (see *Infra*, para. 357).

[36] See *Mahābhārata, Āśmedhika Parva*, Chapter 66.

[37] See *supra*, para. 243.

281. Nor is this inconsistent with the number of generations between Dāśarathi Rāma and Bṛihadbala. For, the *Bhāgavata* gives 25 generations from Śree Rāma to Bṛihadbala and the other Purāṇas give 32. It is clear that some mistake has crept in here. It appears that the Kings of several lines of descendants of Dāśarathi Rāma have been mentioned together and that the line is thus lengthened by mistake. The *Matsya Purāṇa* gives in Chapter 12 fifteen generations from Śree Rāma to Śrutāyu, who was killed in the Mahābhārata War. We ought to take this shortest line as the most reliable. On this basis the interval between Dāśarathi Rāma and Vedavyāsa, *i.e.*, the Tretā Yuga plus four quaternaries are equal to thirteen generations; (taking the generation of Śrutāyu to be the same as that of the Pāṇḍavas, who were 2nd in descent from Vedavyāsa). Therefore the Tretā Yuga is equal to $(13 \times 22 - 16) = 270$ years or in round numbers 300, agreeing with the dimension of the Dwāpara previously determined. This clearly supports the conclusion that the Dwāpara is equal to 200 years. We may, therefore, take it as proved that the Kali was 100 years, the Dwāpara 200 years, the Tretā 300 years and the Kṛita was 400 years.

SECTION F

282. We shall now consider what is meant by a Kalpa and what are the dimensions of a Kalpa.

283. The word Kalpa is derived from the root कृप् that means to create, to plan, or to devise. A Kalpa, therefore, means a period of creating the same thing again. For instance, the period of four years at the end of which another President is elected in the United States, can be called a Kalpa. The framing of a new constitution would be also the beginning of a new Kalpa or rather of a greater Kalpa (Mahākalpa), while the period of re-elections by virtue of that constitution would be a small Kalpa. It would be seen hereafter that the word Kalpa was used in both these senses, *i.e.*, in the sense of a Mahākalpa or a larger Kalpa and of a smaller Kalpa.

284. Why was the Kalpa called a Kalpa? The reason is that the Manu, Saptarishis (मनु, सप्तर्षि) and other Devas or public functionaries were freshly elected or selected in every Kalpa. This would appear from the following passage :—

क्षीणे कल्पे तदा तस्मिन् दाहकाल उपस्थिते ।
तस्मिन्कल्पे तदा देवा आसन् वैमानिकास्तु ये ।
एकैकस्मिंस्तुकल्पे वै देवा वैमानिकाः स्मृताः ॥ १८ ॥
देवाश्च पितरश्चैव मुनयोमनवस्तथा ।
ततस्तेऽवश्यभावित्वात् बुद्ध्वा पर्यायमात्मनः ।
त्रैलोक्यवासिनो देवा इहस्थानाभिमानिनः ॥ २३ ॥
स्थितिकाले तदा पूर्णे आसन्ने पश्चिमेंतरे ।
कल्पावसानिकादेवाः तस्मिन् प्राप्ते ह्युपप्लवे ॥ २४ ॥
तेनौत्सुक्यविषादेन त्यक्त्वा स्थानानि भावतः ।
महर्लोकाय संविग्नास्ततस्ते दधिरे मतिम् ॥ २५ ॥
ते युक्ता उपपद्यंते महसि स्थैः (स्वैः) शरीरकैः ॥ २६ ॥[38]

[Translation.—" When the Kalpa came to an end and the time of burning (offerings in the Aśvamedha) arrived, the Vaimānika Gods that were in that Kalpa (the Vaimānika Gods are those who remain Gods for one Kalpa only), namely, Gods, Pitaras, Ṛishis and Manus, whose authority terminates by a Kalpa (कल्पावसानिकाः), who stay in Trailokya and who are proud of their offices (स्थानाभिमानिनः) knowing that the time of their office had expired and knowing further, when the subsequent period (पश्चिमेंतरे) had arrived and when the end was near, that their inevitable end had arrived, put their heart upon (दधिरे मतिम्) going to the Maharloka and they went to the Maharloka with their own bodies."]

285. That the Manu, the Saptaṛishis and other Gods were public functionaries is shown by the following passage :—

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[38] *Vāyu Purāṇa*, Chapter 7.

महेति व्याहृतेनैव महर्लोकस्ततोऽभवत् ।
विनिवृत्ताधिकाराणां देवानां यत्र वै क्षयः ॥ २३ ॥[39]

[*Translation.*—" When Brahmā uttered the word (महा) Mahā the Maharloka came into existence. The Maharloka is the abode of Gods who have retired from their offices."] As the Manu and the Saptarishis went into the Maharloka, the abode of retiring officers, after leaving their places they must be public functionaries.

286. These passages clearly show that the period of office of the Manu and the Ṛishis (मनु, सप्तर्षि) was a Kalpa. It follows that fresh elections or selections for the office of these functionaries must have been made at the beginning of every new Kalpa.

287. But what is the dimension of a Kalpa? As the Kalpa is also the period of a Manu it must be equal to four years; for we have already seen that the Manvantara, *i.e.*, the period of the Manu, is equal to four years. (See Section D above.) Moreover as the Manus and the Ṛishis were human beings and went with their bodies to the Maharloka after the expiry of the Kalpa, the Kalpa must be much less than the life of a human being. The following discussion will show that 28 Kalpas are equal to 112 years and that one Kalpa is equal to four years of 1461 days each, the 28th Kalpa consisting of 1460 days only.

288. We have the following statements in the *Vāyu Purāṇa*:—

आसीत्तु सप्तमः कल्पः पद्मोनाम द्विजोत्तमाः ।
वाराहः सांप्रतस्तेषां तस्य वक्ष्यामि विस्तरं ॥ १२ ॥
भवस्तु प्रथमः कल्पो लोकादौ प्रथितःपुरा ॥ २८ ॥
द्वितीयस्तु भुवः कल्पस्तृतीयस्तप उच्यते ॥ २९ ॥ इत्यादि [40]

[*Translation.*—" Oh excellent Brāhmaṇas, the seventh Kalpa was that which was named Padma. The present

[39] *Vāyu Purāṇa*, Chapter 101.
[40] *Ibid.*, Chapter 21.

Kalpa is Vārāha. I shall tell its details. The first Kalpa in the beginning of the world was Bhava, the second was Bhuva, the third was Tapas,....the seventh Kratu, the eight Vahni, etc."]

Here in the 21st Chapter we have 28 names of the 28 Kalpas, the last being Bṛihat. It should be noted that the names of the seventh and the eighth Kalpas are Kratu and Vahni instead of Padma and Vārāha as stated in the twelfth verse. This and the fact that the 28 names are part of the details of the eighth Vārāha Kalpa, that are promised to be stated prove that these 28 Kalpas are subdivisions of a greater Kalpa also called a Kalpa.

289. After the enumeration of the above 28 smaller Kalpas we have the following statement in the *Vāyu Purāṇa*[41]:

अष्टाशीतिसहस्राणां योजनानां प्रमाणतः ।
रथंतरं तु विज्ञेयं परमं सूर्यमंडलम् ॥ ७७ ॥
तस्मादिदं[42] तु विज्ञेयं अभेद्यं सूर्यमंडलम् ।
यत्सूर्यमंडलंचापि बृहत्साम तु भिद्यते ॥ ७८ ॥
संघातमुपनीताश्च अन्ये कल्पा रथंतरे ॥ ७९ ॥

[*Translation.*—" The Rathantara is the greatest Maṇḍala of the Sun measuring eighty thousand and eight Yojanas. This Maṇḍala of the Sun that is separated by the Bṛihat Sama, *i.e.*, the 28th Kalpa, cannot be broken into smaller parts. The other Kalpas are united into the Rathantara."]

290. What is this Rathantara that is referred to here? It is not mentioned as the name of any of the 28 Kalpas mentioned in the 21st Chapter. It is said to be separated from other Kalpas by the Bṛihat Sama, *i.e.*, the 28th Kalpa. This shows that the Rathantara means the group of first 28 Kalpas ending with the Bṛihat-Kalpa.

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[41] *Vāyu Purāṇa*, Chapter 21.

[42] The reading actually is " तस्मादंडं तु " but as that has no meaning, I have adopted the reading " तस्मादिदंतु ".

291. The following statement in Chapter 22 preceding the mention of five other Kalpas is also very important and shows that the group of 28 Kalpas was called the Rathantara. The statement is as follows :—

> अष्टाविंशतिर्ये कल्पा नामतः परिकीर्तिताः ।
> तेषां पुरस्ताद्वक्ष्यामि कल्पसंज्ञा यथाक्रमं ॥ ७ ॥
> रथंतरस्य साम्नस्तु उपरिष्टान्निबोधत ।
> कल्पांते (कल्पानां ?) नामधेयानि ......॥ ८ ॥[45]

[*Translation.*—" I shall now mention the names of Kalpas coming after the 28 Kalpas whose names have been given before. Learn the names of the Kalpas after Rathantara Sama."]

In this passage the author proposes to narrate the names of the Kalpas coming after the Rathantara. He also says that he will mention the names of the Kalpas after the 28 ones, which have already been mentioned by names. Both these statements obviously mean the same thing. It follows that the Rathantara was nothing else than the group of 28 Kalpas which the author says he has already named.

292. Now what is the meaning of the statement that the Rathantara is the largest Maṇḍala of the Sun ? A Kalpa is no doubt some period of time. The Rathantara which is the group of 28 Kalpas must, therefore, be a period of time also. As the Rathantara is said to be Sūrya-Maṇḍala the word Maṇḍala also must connote the period of the complete revolution or revolutions of the Sun. Maṇḍala is, therefore, equivalent to a " cycle " of time. How can this period of the Rathantara be described as the largest Maṇḍala of the Sun ? Because it contains smaller Maṇḍalas of the Sun and is exactly equal to a period of whole days during which the Sun makes a complete number of revolutions. What is the small Maṇḍala of the Sun ? The smallest number of whole days that are approximately equal to a complete number of revolutions of the Sun. The fact that the Rathantara is called

[45] *Vāyu Purāṇa*, Chapter 22.

the largest Maṇḍala of the Sun and that it contains 28 Kalpas shows that one Kalpa was a small Maṇḍala of the Sun. What is such a small Maṇḍala of the Sun and did the ancient Indians know it? The ancient Indians knew that the Sun performs four revolutions approximately in 1461 *whole* days; we have already seen this[44] when we found out that they took a quaternary of 1461 days. Therefore a Kalpa is really equal to a quaternary. But the Sun does not perform four revolutions exactly in 1461 days. One year, *i.e.*, the Tropical or the seasonal year, is equal to 365·2422 days. Therefore if we take four years to be equal to 1461 days, we will have to omit one whole day again after 128 years. The ancient Indians took it that one whole day is to be omitted after 112 years, *i.e.*, in the 28th quaternary. Therefore the 28th quaternary was taken to be of 1460 days and the whole group of 28 quaternaries was taken to consist of 40907 days, *i.e.*, 81814 half-days. This number agrees with the number of Yojanas in the Rathantara. Yojana is no doubt some period of time. The word Yojana literally means—"Yoking" and may designate a period by which horses of a carriage are unyoked, and may with reference to the Sun's carriage and horses mean half a day figuratively. The number of half-days given in the *Vāyu Purāṇa* must have been given in round numbers and the correct reading may have been अथाशीतिसहस्राणाम् meaning eighty thousand half-days.

293. These conclusions are supported by the number given in a passage in Chapter 50 of the *Vāyu Purāṇa*. This number cannot be a product of mere wild imagination but must obviously correspond to some real measurement of the motions of the Sun or the Moon, since the whole chapter deals with the motions of these planets. That passage is the following:—

चत्वारिंशत्सहस्राणि शतान्यष्टौ च विद्युतः ।
सप्तति चापि तत्रैव नवतिं विद्धिनिश्चये ॥ १८० ॥[45]

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[44] See *supra*, Section A, paragraphs 255–57 and also 258–63.

[45] *Vāyu Purāṇa*, Chapter 50.

[*Translation.*—" The shining ones (days) are forty thousand, eight hundred and seventy and ninety more as determined by the learned."] Here, the reading in the last Pāda of the verse is manifestly wrong; for after giving thousands, hundreds and tens, one would naturally give units and not tens again as appears to have been done. Moreover we do not get from the reading as it is, any number corresponding to any actuality. We, therefore, adopt the reading " नव-विद्वद्विनिश्चये " meaning " nine as determined by the learned ". Thus the number is 40879. This differs from the days of 28 quaternaries, *i.e.*, 40907 by only 28 which number is the same as the number of the Vishuvān days in 28 quaternaries. This suggests that the days other than the *Vishuvān days* were called " shining days (विद्युतः)" probably because as suggested by R. Syāma Shastree in his *Gavām Ayanam*[46] those other days were each represented by a letter in the hymns composed in every quaternary and the Vishuvān was not so represented. Anyhow the difference of 28 days is significant as it corresponds to 28 Vishuvān days of 28 quaternaries and thus the verse shows that the days of 112 years or of 28 Kalpas were 40907 and that the days of one Kalpa are equal to 1461 days. It is also clear that the days of the 28th Kalpa were 1460 days.

294. That a Kalpa is equal to four years is also supported by the following statement where the Kalpa, the period of the Saptarishis, which is the same as that of the Manus as shown by the passage in the *Vāyu Purāṇa*, Chapter 7, quoted above,[47] is designated by the word Yuga, which we know, is equal to four years. The passage is this :—

ततस्तेषु व्यतीतेषु त्रैलोक्यस्येश्वरेष्विह । संप्राप्तेषु महर्लोकं······॥ १२२ ॥ एवं देवेष्वतीतेषु महर्लोकाज्जनं प्रति ॥ १२४ ॥ शून्येषु लोकस्थानेषु महांतेषु भुवादिषु ॥ १२५ ॥ संहृत्यतांस्ततोब्रह्मा देवर्षिपितृदानवान् । संस्थापयति वै सर्गं अहर्दृष्ट्वा युगक्षये १२६ ॥[48]

[46] See *Gavām Ayanam*, pages 15 & 16.

[47] See *supra*, para. 284.

[48] *Brahmāṇḍa Purāṇa*, Pāda 4, Chapter 1 or *Vāyu Purāṇa*, Chapter 100.

[*Translation.*—" Thereafter when the Lords of the Trailokya had gone and reached the Maharloka and when the Gods had gone from the Maharloka to the Janaloka and when all the abodes of people beginning with Bhū (भू) and ending with Mahar had become empty, then Brahmā having withdrawn the Gods, the Ṛishis, the Pitaras and the Dānawas (*i.e.*, having withdrawn their authority) establishes creation (of course of Gods, Ṛishis, etc.) seeing the day at the end of the Yuga."]

295. Having shown that a small Kalpa is equal to four years we have next to consider the period of a Mahā-Kalpa. Now a Mahā-Kalpa cannot obviously have any fixed period if it has its origin in the affairs of State such as framing of new constitutions, etc., for, new constitutions are not framed at regular intervals arbitrarily fixed by man. But a Mahā-Kalpa can have a fixed period if it depends upon the motions of the Celestial Bodies. Such a Mahā-Kalpa is possible. The point of the Equinox moves back one degree in 71·6 years, *i.e.*, it moves back about one constellation in one thousand years, so that the constellation of the Sun at the beginning of the year will change by one after the lapse of one thousand years. It is, therefore, possible that a Mahā-Kalpa was regarded as being equal to 1000 years.

296. The following statement also supports this:—

एषा चतुर्युगावृत्तिरासहस्रात्प्रवर्तते ।
ब्रह्मणस्तदहः प्रोक्तं .... ॥ ११४ ॥[49]

[*Translation.*—"This Chatur-Yuga is taken again and again till one thousand is completed. This is spoken of as one day of the Brahmā, *i.e.*, a Kalpa.

This passage can mean one of the following three things:

(1) that the Chatur-Yuga, *i.e.*, a quaternary, was repeated till thousand years were completed, *i.e.*, that 250 quaternaries make a *Mahā-Kalpa*;

[49] *Vāyu Purāṇa*, Chapter 58.

(2) that the Chatur-Yugas were repeated a thousand times, *i.e.*, that 4000 years make a *Mahā-Kalpa*;

(3) that the four Yugas, the Kali, the Dwāpara, the Tretā and the Kṛita, repeated a thousand times make a *Mahā-Kalpa*.

The first of these meanings supports the proposition that a Mahā-Kalpa was equal to one thousand years; and we can accept the same if we accept that a Mahā-Kalpa must have corresponded to some reality, some striking regularly recurring phenomenon when originally devised. This phenomenon is that the Equinox takes one thousand years to move back one constellation. The larger periods do not correspond to any such phenomenon.

297. The following passage also clearly shows that a new creation was made at the end of every thousand years and thus supports our proposition beyond doubt:—

पंच पंचाशतस्त्रिवृतः संवत्सराः पंच पंचाशतः पंचदशाः पंच पंचाशतः सप्तदशाः पंच पंचाशतः एकविंशाः विश्वसृजां सहस्रं संवत्सरम् ॥ १ ॥ एतेन वै विश्वसृज इदं विश्वमसृजन्त यद्विश्वमसृजंत तस्माद्विश्वसृजः ॥ २ ॥ विश्वमेनाननु प्रजायते य एतदुपयंति ॥ ३ ॥[50]

[*Translation.*—" The Trivṛitstoma Soma Yāga is to be performed for 250 years; the Panchadaśastoma Soma Yāga is to be performed for 250 years. The Saptadaśastoma Soma Yāga is to be performed for 250 years and the Ekavinśastoma Soma Yāga is to be performed for 250 years. In this way is constituted the sacrifice named " one thousand years " of the Creators of the world. By this the Creators of the world created this world. They were called " Creators of the world " because they created the world. The world springs up into existence after those who perform this sacrifice named " one thousand years ".

In the same *Tāṇḍya Brāhmaṇa* in Chapter 25, Khāṇḍa 6, we have the following description of a sacrifice of 12 years:

[50] *Tāṇḍya Brāhmaṇa*, Chapter 25, Khāṇḍa 18.

त्रयस्त्रिवृतः संवत्सराः त्रयः पंचदशाः त्रयः सप्तदशाः त्रयः एकविंशाः प्रजापतेः द्वादशसंवत्सरम् । एतेन वै प्रजापतिः सर्वस्य प्रसवमगच्छत् सर्वस्य प्रसवं गच्छंति य एतदुपयंति ॥[51]

[*Translation.*—"The Trivṛitstoma Soma Yāga is to be performed for 3 years; the Panchadaśastoma Soma Yāga is to be performed for 3 years; the Saptadaśastoma Soma Yāga is to be performed for 3 years and the Ekavinśastoma Soma Yāga is to be performed for 3 years. In this way is constituted the sacrifice named "twelve years" of the Prajāpati. By this the Prajāpati (*i.e.*, the year) gave birth to all and those who perform this sacrifice give birth to all.]

Here, the language used to describe the "thousand years sacrifice" is quite similar to the language used to describe the "twelve years sacrifice". Therefore if the period of the latter sacrifice is twelve years, the period of the former must be taken to be 1000 years. There is no reason to doubt that the period of the "twelve-years-sacrifice" is twelve years especially as the *Vāyu Purāṇa* clearly states that the Ṛishis of the Naimiṣa forest who performed this sacrifice even according to the *Tāṇḍya Brāhmaṇa* (Chapter 25, Khaṇḍa 6, verse 4) performed it for twelve years (see *infra*, para. 340). It is, therefore, quite certain that the sacrifice named "one thousand years" was to be performed for one thousand years.[52] And the passage that is being discussed says that a new world came into existence when the sacrifice was completed.

But how can a sacrifice for one thousand years be performed by man whose span of life is only about 100 years? The answer is that it was not to be performed by a single or a

[51] *Tāṇḍya Brāhmaṇa*, Chapter 25, Khāṇḍa 6.

[52] *Note.*—Jaimini holds that the word samvatsara in the passage "पंच पंचाशत:, etc." means a 'day' and that this sacrifice is to be performed for 1000 days only (*see* 6. 7. 31–40). He is clearly wrong. He has not considered the points discussed here. Jaimini states that the sage Kārshṇājini holds like what is advanced here (*see* 6. 7. 35) that this sacrifice was to be performed for thousand years by a group of several persons (कुलकल्प:).

private individual; but it was to be performed by public functionaries. This is shown by the following two passages:

तपो गृहपतिर्यत्र ब्रह्माब्रह्माऽभवत्स्वयम् । इलायायत्र पत्नीत्वं शामित्रं यत्र बुद्धिमान् मृत्युश्चक्रे महातेजाः तस्मिन्सत्रे महात्मनाम् ॥ ७ ॥[53]

[*Translation.*—"In that sacrifice the Sun was the Sacrificer, the Brahmā (the highest authority in the state) was the Brahmā, the Earth or the public functionary named Ilā or Irā (see *Nighanṭu*, Chapter V. 5) was the wife and the Death did the duty of Śamitṛi.]

तपो गृहपतिर्ब्रह्म ब्रह्मेरापत्न्यमृतं उद्गाता भूतं प्रस्तोता भविष्यत्प्रतिहर्तर्तव उद्‌गातार आर्तवाः सदस्याः सत्यं होतर्त्तं मैत्रावरुणः...... ॥ ४ ॥[54]

[*Translation* (of the substantial portion).—The Sun is the Sacrificer, Brahmā (the highest authority in the state) is the Brahmā, the Earth or the public functionary, named Ilā or Irā, is the wife, water (अमृतं) is the Udgātā, the Past is Prastotā, the Future is Pratihartā, the Seasons are Upagātṛis, the Truth is the Hota, Ritta is Maitrāvaruṇa,....the public functionary Bhaga (see *Nighanṭu*, Chapter V. 6) is the Grāvastut,....Nights and Days are Idmawāhas and Death is Śamitā.]

These descriptions show that the Sahasra-Samvatsara Satra was virtually the counting of the days of one thousand years by public authorities.

298. What was the new world which was created and came into existence after one thousand years? It can be no other than the world of the constellations. For instance, the constellations were once ordained to begin with the Mṛiga. After the lapse of one thousand years, *i.e.*, in B.C. 3102 which is the beginning of the Vārāha Mahā-Kalpa as will be seen later on (see *infra*, paragraphs 336 and 345), they were ordained to begin with the Rohinī and in B.C. 2102 they were ordained to begin with the Kṛittikās. In B.C. 3102 it

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[53] *Vāyu Purāṇa*, Chapter II.

[54] *Tāṇḍya Brāhmaṇa*, Chapter 25, Khāṇḍa 18.

was also probably ordained after counting the days of one thousand years by actual observation that each quaternary was to consist of 1461 days but that every 28th quaternary was to consist of 1460 days only. This is what the verses 7–10 of *Vāyu Purāṇa*, Chapter 32, already quoted, probably mean (see *supra*, para. 276). In B.C. 2102 it was also probably ordained that the days should be named after the seven planets—the Sun, the Moon, the Mars, the Mercury, the Jupiter, the Venus and the Saturn, in continuous order from the 1st day of the Kṛita Yuga.[55] Such is the creation referred to in the above passage from the *Tāṇḍya Brāhmaṇa* and this was to be repeated every thousand years.

299. This is confirmed by the statement in the *Mahābhārata* about the creation by Viśvāmitra. The statement is this:—

चकारान्यं च लोकं वै क्रुद्धोनक्षत्रसंपदा ।
प्रति श्रवणपूर्वाणि नक्षत्राणि चकार सः ॥ ३४ ॥[56]

[*Translation.*—" Being displeased with the efficiency of the constellations he created another world. Instead (प्राति)

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[55] It has been shown hereafter that the first Kṛita began in 3102 B.C. on a Thursday (see *infra*, para. 336); the next Kṛita would, therefore, begin on a Sunday; for one 1000 years are equal to 365250 days *minus* 8 days (as one day was omitted every 112th year), *i.e.*, equal to 365242. Divided by 7 this leaves a remainder of three only. This means that the first day of the second Kṛita was a Sunday. Thus Sunday was, in fact, the beginning of the new creation or Kalpa of 2102 B.C. These facts are very important when combined with the belief of all Astronomical Siddhāntas that Sunday is the beginning of a Kalpa. They show that the Indians started the system of week-days in 2102 B.C. either having invented the system themselves or having borrowed it from the Chaldeans; and it is, therefore, that we find week days referred to in the *Rāmāyaṇa*, the *Mahābhārata* and the *Atharva Jyotisha*. The question as to who invented the system of week days is beyond the scope of our lectures. It is sufficient to say that the Indians started the system of week days in 2102 B.C. and that this was one of the creations of the Kalpa that began in that year. [Week days are found in the Clay-books of the King Sargaon I of Chaldea and his date is 3800 B.C. very probably. (See Laing's *Human Origins*, pages 45 and 156.) The order of the days can be explained by the Chaldean division of a day into 24 hours or by the Indian division of a day into 60 Ghatis. (See *Dixit*, pages 137, 138 and 395.)]

[56] *Ādi Parva*, Chapter 71.

of the old world or system of constellations, he made constellations beginning with Śravaṇa."]

It is clear from this passage that Viśvāmitra ordained a new system of constellations beginning with the Śravaṇa in place of the old one beginning with the Dhanishṭhā. But this is called a creation of a new world. This shows that the creation referred to in the *Tāṇḍya Brāhmaṇa* was of the same kind.

Thus we come to the conclusion that the system of the constellations was changed every thousand years and that, therefore, the period of thousand years was called a Mahā-Kalpa. This is also proved very clearly by the statement "कल्पस्य तु मुखं शतचतुर्थम्" in verse 19, Chapter 32, of the *Vāyu Purāṇa*, already cited; for, that shows that the four months or Yugas, together make a Kalpa.

SECTION G

300. Let us now consider the starting point of the Yugas. We are told in the *Mahābhārata* that the Mahābhārata War was fought just after and within seven years from the beginning of the Kali. And we have seen that the date of the Mahābhārata War is 1197 B.C. Therefore, the first Kṛita Yuga must have started just before and within seven years of 2097 B.C. or 3097 B.C. or 4097 B.C., etc.; of these several dates for the starting of the first Kṛita the date 3097 B.C. strikes us most, for it is nearest to 3102 B.C., the starting point of the Kali of the Astronomical Siddhāntas. This is a date on which all planets were together near about the end of the Revatī and it is quite possible that a historical Era was started from such a date. The Astronomical Siddhāntas state directly or indirectly that all the planets were in conjunction in the end of the Revatī, in the beginning of the Astronomical Kalpa or in the beginning of the starting of their motion (ग्रहचारारंभ). This statement can have its origin in the fact that the Kalpa, *i.e.*, the first Kṛita in the Human system of the Yugas was started on the day on which

the planets were seen together near about the end of the Revatī. All these considerations suggest that the first Kṛita in the human system of the Yugas started in 3102 B.C. on the day on which all the planets were together near about the end of the Revatī.

301. That the first Kṛita started in about 3102 B.C. is also evidenced by the following statement in combination with the number of generations that have been said to have passed between Śree Rāma and the Swāyambhuva Manu. The statement is as follows:—

मनोः स्वायंभुवस्यासन् दशपुत्रास्तु तत्समाः । यैरियं पृथिवी सर्वा सप्तद्वीपसमन्विता ॥ ४ ॥ ससमुद्राकरवती प्रतिवर्षं निवेशिता । स्वायंभुवेऽन्तरेपूर्वं आद्ये त्रेतायुगे तदा ॥ ५ ॥[57]

The susbstance of this passage is that the Swāyambhuva Manu had ten sons, who occupied this whole earth in the first Tretā Yuga.

Now Purāṇas give twenty generations from the Swāyambhuva Manu to the Vaivasvata Manu and twenty-three from the Vaivasvata Manu to Sīradhwaja, the father-in-law of Śree Rāma (we should not accept as correct the generations from the Vaivasvata Manu to Śree Rāma; for different Purāṇas and the *Rāmāyaṇa* differ on the number of these generations while they all agree about the generations between the Vaivasvata Manu and Sīradhwaja) and they give 32 generations from Śree Rāma to the Pāṇḍavas at the greatest. This makes the total of 75 generations or about 1650 years. We get almost the same number in another way also. The number of generations between the Vaivasvata Manu and the Pāṇḍavas is stated to be forty-five (for all this information about generations see *infra*, paragraphs 367, 376, 386, 388, 397 and 398) and this shows that about 1430 years passed between the Swāyambhuva Manu and the Bhārata War. This is more reliable than the former, as in the former calculation we have assumed 32 generations to have passed between

[57] *Vāyu Purāṇa*, Chapter 33.

Śree Rāma and the Pāṇḍavas, which, as we shall elsewhere see, is not quite accurate.[58] The date of the Pāṇḍavas or the Bhārata War is already proved to be 1197 B.C. It follows that the approximate date of the Swāyambhuva Manu is 2700 B.C. and as the Swāyambhuva Manu lived in the first Tretā, the first Kṛita must have begun approximately in 3100 B.C.

302. We shall, therefore, take it as our hypothesis that the starting point of the Astronomical Kali was also the starting point of the historical system of the Yugas, *i.e.*, of the first Kṛita of the human system of the Yugas and show that this hypothesis explains and is confirmed by the various statements in the *Rāmāyaṇa* and other works.

303. The birth of Dāśarathi Rāma is stated to have taken place in the 24th quaternary of the Tretā, of course, the second Tretā. On our hypothesis, therefore, it must have taken place between 1492 to 1496 years of the Era beginning from 3102 B.C. The years 1492 and 1496 are the long years, *i.e.*, the years in which the Aśwamedha could be performed and according to the *Rāmāyaṇa*, Rāma was born in the Chaitra, the 12th month after the completion of the Aśwamedha.[59] Therefore the date of the birth of Śree Rāma would be 1493 of this Era, *i.e.*, 1609 B.C. If this agrees with the astronomical statements in the *Rāmāyaṇa* our hypothesis would be confirmed and at the same time the date of the birth of Śree Rāma would also be proved to be 1609 B.C.

304. Śree Rāma was twenty-five years old when he was sent into exile. This is proved by the verse,

मम भर्ता महातेजा वयसा पंचविंशकः ॥ १० ॥[60]

where Sīta says that her husband was 25 years of age when exiled. Therefore the date of the beginning of Śree Rāma's

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[58] See *infra*, para. 388.

[59] See *Bāla Kāṇḍa*, Chapter 18, verses 1-10.

[60] *Āraṇya Kāṇḍa*, Sarga 47.

exile would be 1518 of this Era or 1584 B.C., *i.e.*, 2082 (3180 — 1518 + 420) years before our Zero-date.[61]

305. The mean motions of 2082 years according to the mean motions of the Zero-date, *i.e.*, Śaka 421, are:—

Mars	348	degrees	(plus)
Jupiter	187	,,	,,
Mercury	235·5	,,	,,
Venus	96	,,	,,
Moon	261·97333	,,	,,
Moon's aphelion ..	95·84666	,,	,,
Rāhu	339·435	,,	(minus)
Time[62] = 4 days 46 Ghaṭīs 21 Palas and 54 Vipalas		,,	(plus)

Hence in the beginning of the year we get the following longitudes of the planets at two days 28 Ghaṭīs, 38 Palas 6 Vipalas from the mean sunrise at Ujjain on a Sunday.

Mean Sun	0·0	degrees
Mean Mars ..	19·1	,,
Mean Jupiter ..	0·5	,,
Mean Moon ..	18·82666	,,
Moon's aphelion ..	299·85333	,,
Rāhu	331·635	,,
Mean Venus ..	260·3	,,
Mean Mercury ..	307·87	,,

Exactly 19 days before this on Thursday we get the following longitudes of the planets:—

Mean Sun	341·40	degrees
Mean Moon ..	129·68	,,
Mean Mars ..	9·17	,,
Rāhu	333·544	,,
True Sun	343·50	,,
True Moon ..	129·13	,,
True Mars	5·1	,,

Time = 4 days 28 Ghaṭīs 38 Palas 6 Vipalas[63].

[61] See *suprá*, paragraphs, 82 and 83.

[62] This is the remainder left after dividing by seven the number of days in 2082 years.

[63] The Sun, the Moon and the Rāhu have been given here correction for time.

It should be noted that the longitudes of the Pushya and the Uttarā Bhādrapadā are 108°·85 and 354°·2 respectively. This shows that at the sunrise of this Thursday the *Tithī* was the 12th and the longitude of the Moon was nearly 121¾ degrees. Though the Moon was then almost at the end of the Pushya, it could have been in the Pushya by the wrong calculation of those days during a large part of the day. We have seen that in the *Vedānga-Jyotisha* of Yajur Veda the cycle consisted of 1831 days. The Moon must then have been held to perform only 67 revolutions in these days though actually it performs 67 revolutions and goes 5°·9 more.[64] Therefore the calculated Moon would be less than the actual Moon and the calculated *Tithi* also would be less than the actual.

306. This position of the Moon agrees with the statement:

अद्य बार्हस्पतः श्रीमान् युक्तः पुष्येण राघव ॥ ९ ॥[65]

where Sīta says to Śree Rāma on the 1st day of the exile, " To-day is Thursday combined with the Pushya." It may be objected that the month during which this particular Thursday occurs according to our calculation is not the Chaitra as required by the verse

चैत्रः श्रीमानयं मासः ॥ ४ ॥[66]

because the Moon when full would be in the Poorvā Phalgunī as it was in the Pushya on the 12th *Tithi.* But this thing is possible even in the Chaitra if the intercalary month is to follow very soon.

307. The positions of the other planets also agree with the following statement of Daśaratha about the position of planets just before the exile.

अवष्टब्धं च मे राम नक्षत्रं दारुणग्रहैः ।
आवेदयंति दैवज्ञाः सूर्यांगारकराहुभिः ॥ १८ ॥[67]

[64] See *supra*, para. 207.
[65] *Ayodhyā Kāṇḍa*, Sarga 26.
[66] Kāṇḍa 2, Sarga 3.
[67] *Ayodhayā Kāṇḍa*, Sarga 4.

[*Translation.*—" Oh Rāma, 'the astrologers say that' the constellation of my (Daśaratha's) birth has been blocked up by evil planets namely the Sun, the Rāhu, and the Mars. "] For, as the calculations show the constellation Uttarā Bhādrapadā has been blocked up on the one side by the Sun and the Rāhu and on the other side by the Mars. Thus the positions of the planets agree very closely with the exact meaning of 'अवष्टब्धम्'. Therefore this exact agreement confirms our hypothesis that the first Kṛita began in 3102 B.C. and also proves the date of Śree Rāma's birth.

308. These are not the only statements in the *Rāmāyaṇa* that agree with our hypothesis. We shall proceed to show that in fact, all genuine astronomical statements in the *Rāmāyaṇa* agree with our hypothesis. We shall deal with all these statements one by one.

309. Three days after the day on which Śree Rāma was to be installed as Yuvarāja, we get the following longitudes of the planets approximately:—

Planet	Longitude in Degrees	Planet	Longitude in Degrees
Mean Sun ..	343·98	True Sun ..	346·33
Mean Moon ..	164·13	True Moon ..	164·13
Mean Mars ..	11·0	True Mars ..	7·0
Mean Jupiter ..	359·0	True Jupiter ..	358·6
Mean Mercury ..	242·0	True Mercury ..	324·0

This agrees with the statement

त्रिशंकुर्लोहितांगश्च बृहस्पतिबुधावपि ।
दारुणाः सोममभ्येत्य ग्रहाः सर्वे व्यवस्थिताः ॥ ११ ॥[68]

[*Translation.*—" The dreadful Triśanku, the Mars, the Jupiter, and the Mercury all stood in front of the Moon."][69]

[68] *Ayodhyā Kāṇḍa*, Sarga 41.

[69] The word 'अभ्येत्य' can also be translated as 'Came to' but we cannot accept this sense of the word 'अभ्येत्य'. For, we know that the

The calculations given above will show that when the Moon was near the Eastern Horizon the previous evening, the Mars and the Jupiter were near the Western Horizon and that when the Moon was near the Western Horizon, the Mercury was near the Eastern Horizon and the Triśanku, Alpha Crusis, also, whose longitude is 201°·45 and latitude is 52°·55 South was near the Southern Horizon at its greatest height when the Moon was near the Zenith. All this supports the statement that the Triśanku, the Mars, the Jupiter and the Mercury stood in front of the Moon.

310. An eclipse of the Sun occurred after the departure of Śree Rāma from Ayodhyā. It is described in the following words:—

तस्मिंस्तु पुरुषव्याघ्रे निष्क्रामति कृतांजलौ ।
नाग्निहोत्राण्यहूयंत सूर्यश्चांतरधीयत ॥ १ ॥[70]

[*Translation.*—" When Śree Rama had gone away with folded hands the people did not offer oblations to the Fire and the Sun was concealed, *i.e.*, eclipsed."]

As Śree Rama was exiled in the bright half of the month, the eclipse of the Sun could not have occurred until after at least 15 days from Śree Rāma's departure. We cannot, therefore, construe this statement to mean that the Sun's eclipse occurred just on the first day of the exile. We must, therefore, hold that the poet is here generally describing the events of several days after the exile and that the Solar Eclipse occurring some months after Śree Rāma's departure would also be mentioned by the poet.

Mars was near the Sun from " अवष्टब्धं च मे राम नक्षत्रं दारुण ", etc., and the Mercury must always be near the Sun; so they cannot go near the Moon which being in the Pushya at the time must be very distant from the Sun in the month of the Chaitra. The Triśanku also being far distant from the path of the planets can never be near the Moon ; so we have to translate ' अभ्येत्य ' in another way, *i.e.*, ' Came in front of ' (आभि).

[70] *Ayodhyā Kāṇḍa*, Sarga 41.

311. As a matter of fact as the calculations show an eclipse of the Sun did occur about 5½ months after Śree Rāma's departure. The greatest magnitude of this eclipse was 24 minutes, 10 seconds, at 16 Ghaṭīs 37 Palas and 54 Vipalas from mean sunrise at Ayodhyā, the Sun's disc being 31·9 minutes. It was a very large eclipse and the poet would not fail to mention it as it happened only 5½ months after the Paurṇimā next following the exile.

312. Hundred and thirty-five lunar months after this eclipse, another Solar Eclipse took place on the banks of the river Godāvarī. It could be seen between the latitudes 25° South and 34° North approximately. The latitude of the Godāvarī being from about 20° North (Nāsika) to 17° North (Rājamahendrī), about half the Sun could be seen eclipsed on the Godāvarī. This Solar Eclipse agrees with that described in the following statement :—

जग्राह सूर्यं स्वर्भानुरपर्वणि महाग्रहः ॥ १२ ॥
निष्प्रभोऽभूद्दिवाकरः ॥ १३ ॥[71]

[*Translation*.—"The great planet Rāhu eclipsed the Sun on a day other than Amāvāsyā. The Sun became devoid of lustre."]

313. Śree Rāma wandered amongst the hermitages on the Godāvarī for ten[72] years and then he went to live at Panchavaṭī; and it was at Panchavaṭī that the demon Khara came to attack Śree Rāma with his Rākshasas. It is at this time that the eclipse is described to have occurred. This accords with the period of 135 lunar months; for they with the five months and a half between exile and the Solar Eclipse at Ayodhyā make 140·5 months, *i.e.*, 11·35 years. Śree Rāma stayed at Chitrakūṭa for about three months and he must have required about three months to go to the Godāvarī. Ten years after that he went to Panchavaṭī on the Godāvarī. The events between Śree Rāma's reaching Panchavaṭī and the

[71] *Āraṇya Kāṇḍa*, Sarga 23.
[72] See *Āraṇya Kāṇḍa*, Sarga 11, verses 25–28.

The calculations given above will show that when the Moon was near the Eastern Horizon the previous evening, the Mars and the Jupiter were near the Western Horizon and that when the Moon was near the Western Horizon, the Mercury was near the Eastern Horizon and the Triśanku, Alpha Crusis, also, whose longitude is 201°·45 and latitude is 52°·55 South was near the Southern Horizon at its greatest height when the Moon was near the Zenith. All this supports the statement that the Triśanku, the Mars, the Jupiter and the Mercury stood in front of the Moon.

310. An eclipse of the Sun occurred after the departure of Śree Rāma from Ayodhyā. It is described in the following words:—

तस्मिंस्तु पुरुषव्याघ्रे निष्कामति कृतांजलौ ।
नाग्निहोत्राण्यहूयंत सूर्यश्चांतरधीयत ॥ १ ॥[70]

[*Translation.*—"When Śree Rama had gone away with folded hands the people did not offer oblations to the Fire and the Sun was concealed, *i.e.*, eclipsed."]

As Śree Rama was exiled in the bright half of the month, the eclipse of the Sun could not have occurred until after at least 15 days from Śree Rāma's departure. We cannot, therefore, construe this statement to mean that the Sun's eclipse occurred just on the first day of the exile. We must, therefore, hold that the poet is here generally describing the events of several days after the exile and that the Solar Eclipse occurring some months after Śree Rāma's departure would also be mentioned by the poet.

Mars was near the Sun from "अवष्टब्धं च मे राम नक्षत्रं दारुण", etc., and the Mercury must always be near the Sun; so they cannot go near the Moon which being in the Pushya at the time must be very distant from the Sun in the month of the Chaitra. The Triśanku also being far distant from the path of the planets can never be near the Moon; so we have to translate 'अभ्येत्य' in another way, *i.e.*, 'Came in front of' (आभि).

[70] *Ayodhyā Kāṇḍa*, Sarga 41.

[*Translation.*—" Śree Rāma says to Sugrīva: 'To-day the constellation is the Uttarā Phalgunī and to-morrow it will be the Hasta. Oh Sugrīva, let us start with all our forces'."]

शुभानि तव पश्यामि सर्वाण्येवार्थसिद्धये ॥ ४६ ॥
उशनाश्च प्रसन्नार्चिरनुत्वां भार्गवोगतः ॥ ४८ ॥
नैऋतं नैऋतानां च नक्षत्रमतिपीड्यते ।
मूलोमूलवतास्पृष्टो धूप्यते धूमकेतुना ॥ ५७ ॥
सर्वं चैतद्विनाशाय राक्षसानामुपस्थितं ।
काले कालगृहीतानां नक्षत्रं ग्रहपीडितम् ॥ ५४ ॥[76]

[*Translation.*—" Lakshmaṇa says: 'Oh Rāma, I see all good omens tending to the accomplishment of your object. The Venus, the son of Bhṛigu with bright lustre, is going along with you. The constellation Mūla which is the constellation of the Rākshasas, is afflicted too much (both by the comet and the planet). The Mūla constellation is, as it were, emitting smoke on account of a comet having a tail. All this and their constellation, *i.e.*, Mūla being afflicted by a planet are going to effect a destruction of the Rākshasas.

316. These passages show that at the time of the marching of Śree Rāma from Kishkindhā a planet and a comet were in the Mūla and that the Venus was seen, shining brilliantly. We cannot compute the position of the comet but we can compute the positions of other planets and we get the following result approximately.

Planet	Longitude	Planet	Longitude
Mean Sun ..	216°·13	True Sun ..	215°·13
Mean Venus ..	73°·7	True Venus ..	170°·0
Mean Mars ..	271°·3	True Mars ..	245°·8
Mean Moon ..	178°·69		

The mean Moon is in the Chitrā constellation. The longitude of the Mūla is 243°. This shows that the Mars was

[76] *Yuddha Kāṇḍa*, Sarga 4.

in the Mūla and that the Venus was seen on the left when in the morning the army of Śree Rāma was marching to the South. Thus the Venus must have appeared as it were to go along with Śree Rāma as described in the above passage. At this time the Moon also could be in the Hasta and the month also could be the Kārtika as on the previous Paurṇimā the Moon was in the Bharaṇī. This shows that Śree Rāma started with his army on the 27th or 26th *Tithi* of the dark half of the Kārtika.

317. Seventeen and a half lunar months after the Solar Eclipse on the Godāvarī, *i.e.*, about 46 days after Śree Rāma started from Kishkindhā, we get a total eclipse of the Moon on Wednesday at 52 Ghaṭīs and 9 Palas and this agrees exactly with what is described in the following passage :—

रजन्यामप्रकाशस्तु संतापयति चंद्रमाः ।
कृष्णरक्तांशुपर्यंतो लोकक्षय इवोदितः ॥ ८ ॥ ९ ॥[77]

[*Translation.*—" The Moon does not shine even in the night and tortures the mind. The edges of the Moon are blackish red showing as if the end of the world has arrived."]

This is a part of the description of the night on which the army of Śree Rāma crossed the bridge made by the Monkeys. It is obviously a description of a total eclipse of the Moon; for, in such an eclipse the Moon does not become black but becomes blackish red and can be seen as void of lustre.

318. On the date namely 1531·0922 years from the beginning of the Kṛita as assumed by us, in the evening of mean Amāvāsyā, we get the following positions of the planets:

Planets	Degrees of Longitude	Planets	Degrees of Longitude	Constellation
Mean Sun ..	33·2	True Sun ..	34	Krittika
Mean Mars	5·8	True Mars ..	23·4	Bharaṇī
Mean Venus ..	1·75	True Venus ..	20·35	"
Mean Mercury ..	77·14	True Mercury	46·7	Rohiṇī

[77] *Yuddha Kāṇḍa*, Sarga 23.

This agrees exactly with the following :—

रामचंद्रमसं दृष्ट्वा ग्रस्तं रावणराहुणा ।
प्राजापत्यं च नक्षत्रं रोहिणीं शशिनः प्रियाम् ।
समाक्रम्य बुधस्तस्थौ लोकानामशुभावहः ॥ ३२ ॥
कौशलानां च नक्षत्रं व्यक्तमिंद्राग्निदैवतम् ।
आक्रम्यांगारकस्तस्थौ विशाखमपि चांबरे ॥ ३५ ॥[78]

[*Translation.*—" Seeing that Śree Rāma was overwhelmed by Rāvaṇa like the Moon by the Rāhu, the Mercury portending evil to the people occupied the Rohiṇī loved by the Moon; and the Angāraka had an aspect upon the Viśākhā, the constellation of the Kauśalas."]

The following passage also tells us that this fight between Śree Rāma and Rāvaṇa began on an Amāvāsyā :—

अभ्युत्थानं त्वमद्यैव कृष्णपक्षचतुर्दशीम् ।
कृत्वा निर्याह्यमावास्यां विजयाय बलैर्वृतः ॥ ६५ ॥[79]

[*Translation.*—" Making preparation this very day which is the 14th *Tithi* of the dark half, you (Rāvaṇa) should start off for victory on the Amāvāsyā accompanied by forces."]

Now the calculations given above show that both the Venus and the Mars were then at a distance of 13½ constellations from the Viśākhā star. Both can, therefore, be said to have an aspect upon Viśākhā and to afflict it.

The above description, therefore, agrees with our calculation, whether by " Angāraka " the author means the Mars or the Venus. (For a discussion of the meaning of the word Angāraka see *supra*, para. 127.)

319. We thus see clearly that the astronomical statements in the *Rāmāyaṇa* confirm our hypothesis that the Kṛita Yuga started from 3102 B.C., *i.e.*, from the year *minus* 3600. There is one statement however that we have not yet explained. That statement is the following :—

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[78] *Rāmāyaṇa, Yuddha Kāṇḍa*, Sarga 103.
[79] *Yuddha Kāṇḍa*, Sarga 93.

चैत्रे नावमिके तिथौ ॥ ९ ॥ नक्षत्रे दितिदैवत्ये स्वोच्चसंस्थेषु पंचसु । ग्रहेषु कर्कटे लग्ने वाक्पताविंदुना सह ॥ १० ॥ प्रोद्यमाने....जनयद्रामं सर्वलक्षणसंयुतम् ॥ ८० ॥[80]

This statement speaks in terms of the Rāśis. The Rāśis or the Signs, however, became known to, or were devised by, the Indians much later than the Mahābhārata War and the *Vedānga-Jyotisha*. For, the *Mahābhārata* and the *Vedānga-Jyotisha* do not speak in terms of the Rāśis and the Uchchas. The *Rāmāyaṇa* is certainly older than the *Mahābhārata*. It follows that a large part of this passage must have been interpolated by one who wanted to deify Rāma. The late Mr. Kāle says in his *Rāmāyaṇa Nireekshaṇa*, page 174, that this part is not found in the Goudi edition of the *Rāmāyaṇa*. If so, it supports our conclusion that a large part of this passage is an interpolation.

320. On the whole then the *Rāmāyaṇa* confirms our hypothesis about the year of the beginning of the Kṛita. But why was this particular year selected as the first year of the Kṛita Yuga? What peculiarity has this year got that distinguishes it from the other years? The peculiarity is the approximate conjunction of all the planets in the Revatī in that year. Just as it was on account of the conjunction of the planets that the year was marked out as the starting year of the Kṛita Yuga, in the same way the day on which the conjunction actually took place must have been marked out as the first day of the Kṛita Yuga. We shall now show that the statements about the beginnings of the Yugas found in the *Prajāpati Smṛiti* and other works confirm this proposition.

321. These statements are the following:—

माघे पंचदशी कृष्णा नभस्ये च त्रयोदशी ।
तृतीया माधवे शुक्ला नवम्यूर्जे युगादयः ।
भाद्रे कलिर्द्वापरे चैव माघे त्रेता तृतीये नवमी कृते च ॥[81]

[80] *Bāla Kāṇḍa*, Sarga 18.
[81] *Prajāpati Smṛiti*, verses 22–23.

[*Translation.*—"The 15th *Tithi* of the dark half of the Māgha, the 13th *Tithi* of the dark half of the Nabhasya, *i.e.*, the Bhādrapada, the third *Tithi* of the bright half of the Mādhava, *i.e.*, the Vaiśākha and the ninth *Tithi* of the bright half of the Urja, *i.e.*, the Kārtika, are the beginnings of the Yugas. The Kali began in the Bhādrapada, the Dwāpara in the Māgha, the Tretā on the 3rd *Tithi* and the Kṛita on the 9th *Tithi*.

This gives us the beginnings of the four Yugas and shows that some Dwāpara began on the Amāvāsyā of some Māgha. But according to what has been shown above five Human Dwāparas have passed since 3102 B.C. and we do not know exactly which Dwāpara is referred to in this statement. From this statement alone, therefore, we cannot find out the first day of the first Kṛita.

322. We have, therefore, to examine the various theories about the beginning of the year. Loka-mānya Tilak's view is that the year began on the day when the Sun turns to the North, *i.e.*, three months before the Equinox.[82] Others may suppose that the year began on the Equinox or one month before it, *i.e.*, with the beginning of the 'Spring'. Our previous discussion shows that the year must have begun on the day of the conjunction of the planets in the Revatī[83] and this day happens to be two months previous to the Equinox as calculation shows.[84] Which of these theories can we accept as correct?

323. In the year 3102 B.C. it so happens that the Equinox and all the other proposed or proved beginnings of the year, happen about the first *Tithi* of the bright half of some lunar month. And the Dwāpara Yuga referred to in the *Prajāpati Smṛiti* began on an Amāvāsyā. Therefore, between the beginning of the first Kṛita and the beginning of this

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[82] See *Orion*, pp. 26–31.
[83] See *supra*, para. 320.
[84] See *Dixit*, p. 142.

Dwāpara we ought to get a complete number of lunar months. The first Dwāpara does not satisfy this condition; for 700 years are equal to 175 quaternaries of 1461 days each and one day is to be omitted every 28th quaternary and therefore, 700 years are equal to 175×1461 minus 6 days, *i.e.*, 8657 months and 23 *Tithis*.

The second Dwāpara satisfies this condition. Seventeen hundred years from the beginning of the Kṛita are equal to 425 quaternaries. Each quaternary is equal to 1461 days and one day is to be omitted at every 28th quaternary. Therefore, the days of 1700 years are equal to 1461×425 minus 15, *i.e.*, 620910 days. These are almost exactly equal to 21026 lunar months. The second Dwāpara therefore satisfies the condition that there must be a complete number of lunar months between itself and the beginning of the first Kṛita. It can easily be seen that the third, the fourth and the fifth Dwāparas do not satisfy the condition ; for 1000 years being equal to 365242 days are equal to 12368 lunar months and 7½ *Tithis*. Nor is the *Smṛiti* so recent as to refer to the fourth or the fifth Dwāpara. Moreover, we cannot suppose that the Human System of Yugas was continued upto such recent times when the Astronomical System of Yugas was dominant. It is, therefore, clear that the second Dwāpara only satisfies the condition. The Dwāpara referred to in the *Prajāpati Smṛiti* can, therefore, be no other than the second Dwāpara.

324. Seventeen hundred years after 3102 B.C. the longitude of the Equinox was 27°, *i.e.*, the Equinox was almost at the end of the Bharaṇī. At the Paurṇimā of the Māgha, the longitude of the Moon is about 130° (for that is the longitude of the Maghā); the longitude of the Sun would, therefore, be about 310°. At the subsequent Amāvāsyā the longitude of the Sun would be about 325°, *i.e.*, the Sun would be about 62° $(27+360-325)$ behind the Equinox. That means that this Dwāpara started about two months before the Equinox (because the Sun goes 29°·1 in one lunar month).

This also proves the proposition that the Kṛita in 3102 B.C. started two lunar months before the Equinox, *i.e.*, on the day of the approximate conjunction of all the planets in the Revatī. This also further proves that every year began two months before the Equinox.

325. The beginnings of other Yugas also given in the *Prajāpati Smṛiti* agree with the beginning of this Dwāpara. This is shown below:—

From the beginning of the Dwāpara to the beginning of the Kali there are 200 years. These would be equal to 1461 × 50 *minus* 1 day (for, between 1700 and 1900 years, the 28th quaternary comes only once), *i.e.*, 73049 days. These days are equal to 2473 lunar months + 20·16 *Tithis*. Therefore, the Kali must have started on the 21st *Tithi* of some month; but as it is said to have started in the Bhādrapada it is clear that the beginning was shifted by half a year, *i.e.*, 186 *Tithis*. Therefore the Kali ought to start on the 27th *Tithi* and this differs from what is stated in the *Prajāpati Smṛiti* by one *Tithi* only. This can be explained by supposing that a day ceased to be omitted at the 28th quaternary and that the real *Tithi* has been mentioned.

At this beginning of the Kali the longitude of the Sun would, of course, be 120° from the Equinox and the longitude of the Equinox was then 24°. Therefore the longitude of the Sun must have been 144°. Therefore the longitude of the Sun at the next Amāvāsya would be 147°. At the previous Paurṇimā the longitude of the Sun should be 132° and that of the Moon 312°, *i.e.*, the Moon should be in the Śatatārakā. This would, therefore, be the month of Bhādrapada or Śrāvaṇa. This agrees with the statement in the *Prajāpati Smṛiti*. We can, therefore, take it that the beginning of the Kali agrees with our proposition that the Kṛita in 3102 B.C. started on the day two lunar months previous to the Equinox.

326. Now about the next Kṛita-Yuga. Here there is another statement to be considered. It is this:—

यदा सूर्यश्च चंद्रश्च यदा तिष्यबृहस्पती ।
एकराशौ समेष्यंति प्रपत्स्यति तदा कृतम् ॥ ९० ॥[85]

[*Translation.*—" When the Sun, the Moon, the constellation Pushya and the Jupiter will be in the same Rāśi, the Kṛita will begin."]

This is a statement purporting to have been made by Mārkandeya to Yudhishṭhira. It should, therefore, be taken to refer to the Kṛita coming just after the Mahābhārata War. We can get such a position of planets again after a period of 95 years; for, eight revolutions of the Jupiter are equal to 94·89 years, *i.e.*, 95 approximately and 95 years are equal to 1175 lunar months, *i.e.*, the complete number of the lunar months. Therefore, the Sun, the Moon, the Jupiter and the Pushya can be in conjunction after 95 years again. But, of course, we must take that conjunction that comes on, next after the Mahābhārata War. 1133 lunar months after the Amāvāsyā of the Kārtika on which the War began, we get the following positions of the planets on the Amāvāsyā of the Āshāḍha :—

Planets	Degrees of Longitude	Planet	Degrees of Longitude
Mean Sun ..	108	True Jupiter ..	119
Mean Moon ..	"		
Mean Jupiter ..	116		

The longitude of the Pushya is also 108°.

This agrees with the statement under discussion. 1133 months are equal to 91 years and seven lunar months (for 19 years are equal to 235 lunar months) and the Kali started four years and two months before the War. That makes 95 years and nine months. If we take into consideration the

[85] See *Vana Parva*, Chapter 190.

statement that the Kṛita started in the Kārtika, we shall have to take it that the Kṛita started 95 years and 12 months after the Kali began. That comes to 96 years. The days of 96 years are (24 × 1461 – 1) counting as before, *i.e.*, 35063 days and they are equal to 1187 lunar months and 10·5 *Tithis*. Supposing one day of the quaternary ceased to be omitted, we get 1187 lunar months and 11·5 *Tithis*. Therefore, if the Kali started on the 13th *Tithi* and if it was taken to be equal to 96 years, the Kṛita would start on the 9th Suddha of a lunar month and that is so stated in the *Prajāpati Smṛiti* also.

327. This shows that the Kali was really taken to be equal to 96 years. But we have already shown the Kali to be equal to 100 years. How is this discrepancy to be explained ?

328. We have shown in Lecture II that the incorrect calendar of the *Vedānga-Jyotisha* was corrected by omitting one lunar month from the *Vedānga-Jyotisha* Calendar.[86] There is another way also of doing the same. 19 years are equal to 235 lunar months almost exactly. Therefore, if we omit the last year of every fourth Vedānga Yuga, *i.e.*, 13 lunar months, the calendar is adjusted. The following table will show this :—

One Yuga	= 62	Lunar months
Four Yugas	=248	"
Last year of the Yuga ..	= 13	"
19 years of the *Vedānga-Jyotisha* Calendar.. ..	=235	"

That this device was adopted some time after the War, is suggested by the mention of Samvatsarakshaya, *i.e.*, loss of a year, in the verse

क्षयं संवत्सराणां च मासानां च क्षयं तथा ॥ ३०१ ॥[87]

[*Translation.*—" (Observing) the loss of the years as well as loss of the months."]

[86] See *supra*, para. 50.
[87] *Śānti Parva*, Chapter 301; Moksha Dharma.

यदा सूर्यश्च चंद्रश्च यदा तिष्यबृहस्पती ।
एकराशौ समेष्यंति प्रपत्स्यति तदा कृतम् ॥ ९० ॥[85]

[*Translation.*—" When the Sun, the Moon, the constellation Pushya and the Jupiter will be in the same Rāśi, the Kṛita will begin."]

This is a statement purporting to have been made by Mārkandeya to Yudhishṭhira. It should, therefore, be taken to refer to the Kṛita coming just after the Mahābhārata War. We can get such a position of planets again after a period of 95 years; for, eight revolutions of the Jupiter are equal to 94·89 years, *i.e.*, 95 approximately and 95 years are equal to 1175 lunar months, *i.e.*, the complete number of the lunar months. Therefore, the Sun, the Moon, the Jupiter and the Pushya can be in conjunction after 95 years again. But, of course, we must take that conjunction that comes on, next after the Mahābhārata War. 1133 lunar months after the Amāvāsyā of the Kārtika on which the War began, we get the following positions of the planets on the Amāvāsyā of the Āshāḍha:—

Planets	Degrees of Longitude	Planet	Degrees of Longitude
Mean Sun ..	108	True Jupiter ..	119
Mean Moon ..	"		
Mean Jupiter ..	116		

The longitude of the Pushya is also 108°.

This agrees with the statement under discussion. 1133 months are equal to 91 years and seven lunar months (for 19 years are equal to 235 lunar months) and the Kali started four years and two months before the War. That makes 95 years and nine months. If we take into consideration the

[85] See *Vana Parva*, Chapter 190.

that year to the end of that Yuga, we have 17 lunar months including the last *Adhika*. The next Yuga amounts to 61 lunar months; for, at the end of this Yuga the Adhika Māgha must have been omitted as already shown, to correct the mistake in the calendar.[88] Then the new system was adopted and 76 years of 940 lunar months followed. Then two Yugas of 62 lunar months each, followed. Then from the end of those Yugas to the beginning of the Kārtika of the Anuvatsara we get 46 months. Thus we get as shown in the table below 1188 lunar months and 96·25 years. This is in excess of 96 years; for, 96 years amount to 1187 lunar months and 11·5 *Tithis*, while here we get 1188 months and 11 *Tithis* between the beginnings of the Kali and the Kṛita. This discrepancy must be explained before the theory about Samvatsarakshaya, *i.e.*, loss of a year, can be accepted.

Period	Months	Years
From the end of the Bhādrapada in Anuvatsara to the end of that Yuga	17	1·5
The Yuga in which the War was fought	61	5
Next 76 years	940	76
Two subsequent Yugas	124	10
From the beginning of the next Yuga to the end of the Āshwina in the Anuvatsara	46	3·75
TOTAL ..	1188	96·25

332. The explanation of this discrepancy is rendered all the more difficult by the following facts: In the year of the War the Vernal Equinox happened 132 days after the beginning of the War. The beginning of the year of the system of the Human Yugas, therefore, happened two lunar months or 59 days earlier, that is, 73 days after the beginning of the War. Therefore, the year of the system of the Human Yugas as taken in the *Prajāpati Smṛiti* in the statement about

[88] See *supra*, para. 215.

the beginning of the Kali, would begin 183 minus 73, *i.e.*, 110 days or 111 *Tithis* before the beginning of the War, that is on the 10th of the bright half of the Śrāvaṇa. Four years before this it must begin 49 lunar months and 14 *Tithis* back that is on the 11th Vadya of the Śrāvaṇa in the Anuvatsara. Therefore the Kali Yuga must have begun on the 11th of the dark half of the Śrāvaṇa in the Anuvatsara. As there was a mistake of two *Tithis* in the calendar, the real *Tithi* would be the 13th *Vadya* of the Śrāvaṇa. The beginning of the Kali is, however, stated to be the 13th of the dark half of the Bhādrapada. Thus we get a difference of one month. This also must be explained.

333. It is, however, easy to give an explanation of this. What is the Śrāvaṇa Vadya in the *Vedānga-Jyotisha* is the Bhādrapada Vadya in another system, in which the month ends with the Paurṇimā (the month ends with the Amāvāsyā in the *Vedānga-Jyotisha*). So that we have to take it that the Kali really began on the 13th of the dark half of the Śrāvaṇa by the *Vedānga-Jyotisha* system. If we calculate from that to the Kārtika when Kṛita began, we really get 1189 months and 11 *Tithis*. So that instead of being required to explain the excess of one month over 96 years of the Kali, we shall have to explain excess of two months. But the excess of two months can easily be explained by supposing that the beginning of the year was shifted to the Equinox during the Kali Yuga. This will make the length of the Kali Yuga 96 years *plus* two lunar months, *i.e.*, 1187 *plus* two lunar months *plus* 11·5 *Tithis*, *i.e.*, 1189 lunar months *plus* 11·5 *Tithis*; and this we actually find in the statement of the *Prajāpati Smṛiti* if by the Bhādrapada we understand the Śrāvaṇa of the *Vedānga-Jyotisha*.

334. Thus we see that the Kali was taken of 96 solar years and two lunar months and that the beginning of the year was shifted forward by two lunar months.

335. We have thus explained all the beginnings of the Yugas as stated in the *Prajāpati Smṛiti* and obtained

confirmation of our theory that the Kṛita in 3102 B.C. must have begun on the Pratipadā of the Chaitra about two lunar months before the Vernal Equinox. It may be objected that if by Māgha of the Dwāpara mentioned in the *Prajāpati Smṛiti*, we understand the Māgha that ends in Paurṇimā we would get the result that the year began three months before the Equinox. This is undoubtedly true, but then the next Kali ought to begin as the previous calculation in para. 332 shows, on the 13th of the dark half of the Āshāḍha ending in Amāvāsyā or of the Śrāvaṇa ending in Paurṇimā. However, it is mentioned in the *Prajāpati Smṛiti* to have begun on the 13th Vadya of the Bhādrapada. Therefore we have to understand by the Māgha in the *Prajāpati Smṛiti* the Māgha ending in Amāvāsyā and that proves our proposition that in 3102 B.C. the year began two lunar months before the Vernal Equinox. It follows that in those ancient times every year began two months before the Vernal Equinox.

336. The conclusion is that the first Kṛita Yuga began in 3102 B.C. on a day, on which all the planets were in approximate conjunction in the Revatī and from which the Equinox was two lunar months ahead. That day was the first *Tithi* of the bright half of the Chaitra, ending in *Amāvāsyā* and was a Thursday. This day is well known to all astronomical Mathematicians.[89] We will henceforth call the Era beginning from this day the Kalpa Era.

SECTION H

337. Now, we have to consider the question about the interims between the Yugas, *i.e.*, about their dimensions and their positions. In the Astronomical system of the Yugas there are two interims for each Yuga, one before and one after the Yuga, each being one-tenth of the length of the Yuga itself. Presumably the same was true of the Human system of the Yugas and we can, therefore, hold that in the Human system of the Yugas also there were two interims each of the

[89] See [illegible], page 142.

length of one-tenth of the Yuga, one at its beginning and other at its end. But an important question arises here. The length of the Dwāpara is 200 years; its interims, therefore, would be 20 years at the beginning and 20 years again at the end. Would that make the whole length of the Dwāpara to be 240 years as in the Astronomical system or would that keep the length unchanged, *i.e.*, 200 years, the first and the last twenty years of the same being only called interims? We have to decide in favour of the latter solution, for, from the beginning of the Kṛita to Śree Rāma's birth we calculated 1493 years and this we can do only if the interims do not add to the length of the Yugas. It follows that the tenth part of a Yuga in its beginning and in its end was only called its interim but did not add to the length of the Yuga.

SECTION I

338. Now, we are in a position to explain the objection raised against our date of the Mahābhārata War, stated in the beginning of this lecture.

Our date of the Mahābhārata War is *minus* 1695·3, *i.e.*, 1904·7 from the beginning of the first Kṛita, *i.e.*, 1904·7 of the Kalpa Era, as we have called it. The second Kali begins in 1900 Kalpa Era and its interim extends from 1900 to 1910 of the Kalpa Era. This completely explains the statement in the Mahābhārata that the War was fought in the interim between the Dwāpara and the Kali. The Mahābhārata War can also be said to have been fought in the interim between the Divine Dwāpara and the Divine Kali; because, as shown hereafter in paragraph 347, the Divine Kali started in 1102 B.C., *i.e.*, in 2000 Kalpa Era and the interim between the Divine Dwāpara and the Divine Kali, must, therefore, be the period between 1800 Kalpa Era and 2100 Kalpa Era, and the War was fought in 1904·7 Kalpa Era.

SECTION J

339. We must now investigate about the Dwādaśa-Vārshika Satra. A Dwādaśa-Vārshika Satra is referred

to in the very beginning of the *Mahābhārata* in the following words:—

लोमहर्षणपुत्र उग्रश्रवाः सौतिः पौराणिको नैमिशारण्ये शौनकस्य कुलपतेः द्वादशवार्षिके सत्रे ॥ १ ॥ ....अभ्यगच्छत् ॥ २ ॥[90]

[*Translation.*—" The Paurāṇika Souti, named Ugraśravas, son of Lomaharshaṇa, went to the Dwādaśa-Vārshika Satra of Śounaka in Naimiśāraṇya."]

This Śouti then told the history of the Pāṇḍavas to Śounaka and other Ṛishis. This means that this Dwādaśa-Vārshika Satra was performed after the Mahābhārata War.

340. Now what is the Dwādaśa-Vārshika Satra? The following statement shows what it is:—

सिसृक्षमाणा विश्वं हि यत्र विश्वसृजःपुरा ।
सत्रं हि ईजिरे पुण्यं सहस्रं परिवत्सरान् ॥ ५ ॥
विबुधा ईजिरे तत्र सहस्रं परिवत्सरान् ।
तत्र ते ईजिरे सत्रं नैमिशे ब्रह्मवादिनः ॥ ६ ॥
तत्सत्रमभवत्तेषां समा द्वादश धीमताम् ।
पुरूरवसि विक्रांते प्रशासति वसुंधराम् ॥ १४ ॥[91]

[*Translation.*—" Gods (wise men) learned in Brahma worshipped the thousand years at the very place where in ancient times the creators of the world while desiring to create the world, had performed a holy Satra for a thousand years, *i.e.*, in the Naimiśa forest. That Satra of the intelligent men was performed for twelve years, while the valiant Purūravas ruled the Earth."]

This is said in reply to a question by the Ṛishis about the place and the period of the Satra

(कुत्र सत्रं समभवत्तेषामद्भुतकर्मणां ।
कियंतं चैव तत्कालं कथं च समवर्तत) ॥ २ ॥[91]

and cannot be construed in any way other than what we have done.

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[90] *Mahābhārata, Ādi Parva,* Chapter 1.
[91] *Vāyu Purāṇa,* Chapter 2.

341. These passages show that a Satra is performed for twelve years in honour of the passing of thousand years, of course, after every one thousand years, and that it was performed once, during the reign of Purūravas and a second time after the Pāṇḍavas. A Satra for twelve years is described in the *Tāṇḍya Brāhmaṇa*, Chapter 25 and Kaṇḍa 6,[92] and the *Tāṇḍya Brāhmaṇa* also says there that it was performed by the Ṛishis of the Naimiśa forest (एतेन वै नैमिशीयाः सर्वामृद्धिमार्ध्नुवन् ॥). The *Tāṇḍya Brāhmaṇa* also says that the Prajāpati, *i.e.*, the year gave birth to all after the sacrifice of "twelve years" and also adds that those that perform that sacrifice would give birth to all. Now the year does not give birth to any thing after a period of twelve years but gives birth to a new system of constellations after a period of one thousand years, as we have seen already. The *Tāṇḍya Brāhmana*, therefore, confirms the proposition that the Dwādaśa-Vārshika Satra was performed after every one thousand years. Thus both the Sahasra-Samvatsara Satra and the Dwādaśa-Vārshika Satra ended simultaneously and were followed by a new world, *i.e.*, a new system of constellations. About forty-five generations passed between Purūravas and the Pāṇḍavas, according to the Purāṇas. So the date of Purūravas can be 2102 B.C. We have, therefore, to conclude that two Dwādaśa-Vārshika Satras were performed one about 2102 B.C. and the other about 1102 B.C. It was at this last Dwādaśa-Vārshika Satra that Souti, the son of Lomaharshaṇa, recited the *Mahābhārata* to Śounaka and other Ṛishis. The introduction to the *Vāyu Purāṇa* will show that it was his father Lomaharshaṇa, who recited the *Vāyu Purāṇa* to the same Ṛishis.[93]

SECTION K

342. We have seen that a Mahā-Kalpa began in 3102 B.C. and also that a Mahā-Kalpa was one thousand years long. However, a new Kalpa was not started in 2102 B.C.

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[92] See *supra*, para. 297.

[93] See Chapter 1, verses 12–29.

Instead of giving a new name to the period of 1000 years that began on 2102 B.C. it began to be said that the second revolution of the Yugas began in 2102 B.C. and that the period between 3102 B.C. and 2102 B.C. was the first revolution of the Yugas. This is proved by the expression आद्ये त्रेतायुगे already referred to, in verse 5 of the *Vāyu Purāṇa*, Chapter 33[94], and also by the following statement in the *Bhāgavata Purāṇa*

द्वापरे समनुप्राप्ते तृतीये युगपर्यये ।
जातः पराशराद्योगी.... ॥ १४ ॥[95]

[*Translation.*—"The Yogi was born from Parāśara, when Dwāpara had arrived in the third revolution of the Yugas."]

343. The wording " the third revolution of the Yugas " proves that the Kalpa that began on B.C. 3102 was being continued at least during the third revolution of the Yugas.

344. The following passage from the *Vāyu Purāṇa* is very important

यस्त्वयंवर्तते कल्पः वाराहं तं निबोधत ।
प्रथमः सांप्रतस्तेषां कल्पोऽयं वर्तते द्विजाः ॥ ४९ ॥
तस्मिन् स्वायंभुवाद्यास्तु मनवःस्युश्चतुर्दश ॥ ५० ॥[96]

[*Translation.*—"Oh, Brāhmaṇas, this Kalpa which is going on is Vārāha (by name); the present Kalpa, *i.e.*, the Vārāha, is the first of those Kalpas (that constitute the Parārdha of Brahmā). In that Vārāha Kalpa we have 14 Manus beginning with the Swāyambhuva Manu."]

This statement shows that Vārāha Kalpa was going on at the time of the Swāyambhuva Manu. We have shown that Swāyambhuva Manu lived in the first Tretā after 3102 B.C. Therefore the Kalpa that began in 3102 B.C. was Vārāha (by name). The same was going on in the

94 See *supra*, para. 301.
95 Chapter 4, Skanda 1.
96 *Vāyu Purana*, Chapter 5.

third revolution of the Yugas in which the author of the *Bhāgavata* was born.

345. We know traditionally that at present the Vārāha Kalpa is going on. It, therefore, follows both that the Kalpa that began on B.C. 3102 was named Vārāha and that the same Kalpa is still going on.

Section L

346. Thus far we have proved the dimensions and the starting point of the Human system of Yugas. Side by side with this system there was also the system of the Divine Yugas. This has been referred to in the *Bhagavadgīta* in Chapter 8, verse 17, and it has also been referred to in the *Nirukta*, Chapter 14, verse 4, in almost the same words.

347. It seems doubtful what the word Kali Yuga meant in the Divine system; but there is no doubt that it meant a very long period probably a revolution of all the four Yugas, the Kṛita, the Tretā, the Dwāpara and the Kali, of the Human system of Yugas, that is, one thousand years. We have also the following statement in the *Atharva Veda*:—

शतं तेऽयुतं हायनान् द्वे युगे त्रीणि चत्वारि कृण्मः ॥ ८ । २ । २१ ॥

[*Translation.*—" We allot to you hundred or ten thousand years or two, three or four Yugas."]

Lokamānya Tilak and Mr. Aiyar are of opinion that the word one Yuga has been purposely omitted here because one Yuga was equal to a hundred years or ten thousand years.[97] We have seen that one Yuga, *i.e.*, the Kali, is equal to hundred years in the Human system of the Yugas. It follows, therefore, that the Kali in the Divine system of the Yugas was equal to ten thousand years. However, statements about the Divine system of the Yugas found in the *Mahābhārata* in *Vana Parva*, Chapter 188, and the *Maṇusmṛiti*, Chapter 1, verses 68–86, and almost all the Purāṇas show

[97] See *The Arctic Home in the Vedas*, pages 423–24.

that the Divine Kali was equal to one thousand years. These statements cannot be harmonized with the one in the *Atharva Veda* quoted above unless we suppose that 'Ayuta' meant 1000 or that the word used in the above passage in the *Atharva Veda* is युतं and not अयुतं and that युतं meant one thousand. And we can make these suppositions for the word नियुत which means ten thousand also, is formed by the addition of नि expressing intensity to युत and युत or अयुत must, therefore, have meant a smaller quantity presumably one thousand. If we, therefore, make either of these suppositions, all these statements are harmonized and the dimensions of the Divine Kali, Dwāpara, Tretā and Kṛita are shown to be 1000, 2000, 3000 and 4000 years respectively. This is confirmed by the following statement in the *Bhāgavata Purāṇa*. The statement is this:—

तेनैत ऋषयोयुक्तास्तिष्ठन्त्यब्दशतं नृणां ।
ते त्वदीये द्विजाः काले अधुना चाश्रिता मघाः ॥ २८ ॥
यदा देवर्षयः सप्त मघासु विचरंति हि ।
तदा प्रवृत्तस्तु कलिर्द्वादशाब्दशतात्मकः ॥ ३१ ॥

[*Translation.*—"Oh Parikshit, the seven Ṛishis stand in one constellation for one hundred years. They are, now in your time in the Maghā. The Kali of 1200 years started when the seven Divine Ṛishis were moving in the Maghā."] The dimension of the Kali (*i.e.*, 1000 years) becomes 1200 years if the interims are added to it. Therefore this statement shows that the Divine Kali was 1000 years long and that it started sometime within 100 years from the Mahābhārata War. Presumably then this Divine Kali must have started with the Human Kṛita, *i.e.*, in 1102 B.C. The Divine Kṛita must have, therefore, started in 10102 B.C. and the Divine Dwāpara in 3102 B.C., *i.e.*, simultaneously with the Vārāha Kalpa of the Human system.

348. We can now see that the Divine system developed into the Astronomical system by the following misunderstandings:—

(1) The interims between the Yugas were only parts of the Yugas but by misunderstanding they were thought to be additions to the Yugas. Thus the Kali Yuga that was of 1000 years in the Divine system as stated in the *Mahābhārata, Vana Parva,* Chapter 188, was taken to be of 1200 years.

(2) The years of the Yugas though Human were thought to be Divine, *i.e.*, 360 times the Human years. Thus 1200 years of the Kali were thought to be 1200 × 360, *i.e.*, 432000.

(3) The word Chatur-Yuga though it meant four Human years was misunderstood to mean the Kali, the Dwāpara, the Tretā and the Kṛita taken together and was thus made equivalent to 4320000 years. This long period also was then named Mahā Yuga or simply a Yuga.

(4) Historical statements, belonging to the Historical system were misconstrued as if belonging to this Astronomical system. The statement that the period of the Vaivasvata Manu was 68 Yugas was construed to mean that it was 68 × 4320000 years.

(5) As the period of the Vaivasvata Manu was approximately a fourteenth part of 1000 Yugas and as only fourteen Manus were known, the period of 1000 Mahā Yugas that constituted a Kalpa or a day of Brahmā was divided into fourteen parts, 71 Mahā Yugas being assigned to each Manu and fifteen Kṛita Yugas to fifteen interims at the beginning and end of each Manu. See *supra*, para. 296 (3).

(6) The historical statement that the period of the seventh Manu, *i.e.*, the Vaivasvata Manu is going on was true when it was made but it was thought to be true even after all the fourteen Manus passed away. Therefore Vaivasvata Manu is thought to be still going on.

(7) The statement that Vyāsa was born in the 28th quaternary of the Dwāpara (द्वापरे अष्टाविंशे) was misconstrued to mean that Vyāsa was born in the Dwāpara of the 28th Mahā Yuga, of course, of the Vaivasvata Manu.

(8) This Astronomical Dwāpara in which Vyāsa was thought to have had his birth, was then considered to have ended in 3102 B.C. at the starting point of the Vārāha Kalpa by a mistake, the cause of which has not yet been definitely ascertained. Probably the mistake arose during the continuance of the Divine Kali, *i.e.*, between 1102 B.C. and 102 B.C. from the practice of writing the word कलौ meaning 'in the Divine Kali' along with the years elapsed from the beginning of the Vārāha Kalpa, such as, कल्पादिवर्षाणि २७०० कलौ. This wording can have two meanings, namely, (1) that 2700 years had elapsed from the beginning of the Kalpa and that the Divine Kali was then going on; (2) that, the years elapsed from the beginning of the Kalpa were 2700 of the Kali in addition to 27 Mahā Yugas and the Kṛita, the Tretā and the Dwāpara of the 28th Mahā Yuga. Thus this statement can give rise to the mistake we are discussing. It can also give rise to the mistaken supposition mentioned in (2) above.

349. The Astronomical system developed in this way. It has now enveloped the Human system of the Yugas in darkness and has even displaced it and is now misleading the historians. I have, therefore, produced here unimpeachable evidence to prove the dimensions, of the year, the Yuga, the Kalpa, the Manvantara and the Kali, the Dwāpara, the Tretā and the Kṛita Yugas and the starting point of the Human system of the Yugas; and I hope neither traditional belief nor the sense of bewilderment and helplessness will stand in the way of the acceptance of the conclusions arrived at.

LECTURE IV

THE CHRONOLOGY OF PRE-MOURYAN HISTORY (THE DATE OF THE VEDAS)

LECTURE IV

THE CHRONOLOGY OF PRE-MOURYAN HISTORY (THE DATE OF THE VEDAS)

350. Armed with the knowledge of the various cycles, we can now unravel the chronology of the events narrated in ancient Historical Works, especially the *Vāyu Purāṇa.*

351. Unfortunately the *Vāyu Purāṇa* also does not give the history of the times that preceded the Vārāha Kalpa, *i.e.*. 3102 B.C. It clearly states:—

आसीतु सप्तमःकल्पः पद्मोनाम द्विजोत्तमाः ।
वाराहः सांप्रतस्तेषां तस्य वक्ष्यामि विस्तरम् ॥ १२ ॥[1]

[*Translation.*—" Oh, best of the twice-born the seventh Kalpa, named Padma has passed away; of them (Kalpaś) the present (Kalpa) is Vārāha. I shall describe its details."]

This shows that the *Vāyu Purāṇa* gives the history of the Vārāha Kalpa only.

352. We have already seen that a Kalpa is equal to 1000 years and that the Vārāha Kalpa began in the year 3102 B.C. As the Vārāha Kalpa is the eighth Kalpa it is clear that seven thousand years elapsed from some important event to the beginning of the Vārāha Kalpa, *i.e.*, 3102 B.C. But we are nowhere told what that event is. We are, therefore, left to conjecture what that event may be. The most plausible conjecture is that this event was the habitation of the Meru Mountain, that is, the Pamir Plateau (see note in the next paragraph) and the surrounding plains by the ancestors of the Vedic Indians, after the destruction of their original home by frost and glaciers. This substantially agrees with Lokamānya Tilak's date of the same event as propounded by him in *The Arctic Home in the Vedas.* The only difference is that according to our conjecture, the date of

[1] *Vāyu Purāṇa*, Chapter 21.

this event would be about 10000 B.C. while according to Lokamānya Tilak, the date is about 8000 B.C.[2] But our date would seem to be more probable for 8000 B.C. is really the date of the commencement of the Post-glacial period[3] and the Arctic Home must have become unfit for habitation long before it and the Aryans must have left it as soon as it became unfit for habitation.

353. The first Kalpa, that began in 10102 B.C. must have begun with an event of the first magnitude and the habitation of the Meru by the ancestors of the Vedic Indians is undoubtedly such an event. Meru is said to be the abode[4]

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[2] See page 429 of *The Arctic Home in the Vedas.*

[3] See page 37 of *The Arctic Home in the Vedas.*

[4] *Note.*—That Meru is the Pamir Plateau and that it was the abode of Gods is shown by the following passages:—

तत्र देवगणाः सर्वे गंधर्वोरगराक्षसाः ।
शैलराजे प्रदृश्यंते शुभाश्चाप्सरसां गणाः ॥ ५५ ॥
स तु मेरुः परिवृतो भुवनैर्भूतभावनैः ।
चत्वारो यस्य देशा वै नानापार्श्वेष्वधिष्ठिताः ॥ ५६ ॥
भद्राश्वो भरतश्चैव केतुमालश्च पश्चिमः ।
उत्तराः कुरवश्चैव कृतपुण्यपरिश्रयाः ॥ ५७ ॥
तस्य पर्वसहस्रेऽस्मिन् नानाश्रयविभूषिते ।
सर्वदेवनिकायानि संनिविष्टान्यनेकशः ॥ ६९ ॥
नाकपृष्ठं दिवं स्वर्गं इति यैः परिपठ्यते ।
वेदवेदांगविद्वद्भिः शब्दैः पर्यायवाचकैः ॥ ९४ ॥
तदेतत्सर्वदेवानां अधिवासं कृतात्मनाम् ।
देवलोको गिरौ तस्मिन् सर्वश्रुतिषु गीयते ॥ ९५ ॥

(*Vāyu Purāṇa*, Chapter 34).

[*Translation.*—"There on that mountain are seen all Gods, Gandharvas, Nāgas and Rākshasas and Apsaras. That mountain Meru is surrounded on the various sides by countries that support beings, namely by the four countries Bhadrāśva, Bhārata, the Western Ketumāla, and the Northern Kurus, where meritorious people live. In the thousand parts of that mountain adorned by various abodes the numerous dwellings of all the Gods are situated. That which is called by the synonyms Swarga, Nākapṛishṭha, Diva, etc., by those who know the Vedas and its Angas, that abode of all the meritorious Gods,

of Gods. This shows that the ancestors of the Vedic Indians lived there. This Meru is no other than the Pāmir Plateau. All this shows that the ancestors of the Vedic

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i.e., the Devaloka, is situated on this mountain. This is stated in all the Śrutis."]

These verses show that the Meru was the abode of the Gods and also that it was situated in the midst of the four countries namely Bhārata, Ketumāla, Uttara Kuru and Bhadrāśva. This suggests that the Meru was to the north of Bhārata, *i.e.*, India. The following statements in the *Vāyu Purāṇa* help us to determine its exact position.

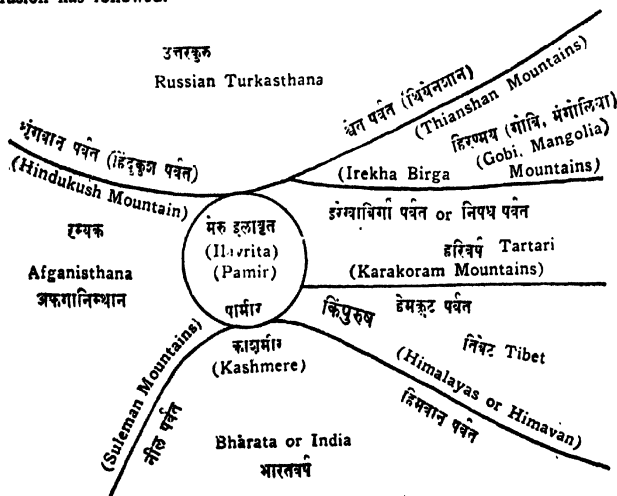
नीलश्च निषधश्चैव ताभ्यां हीनाश्चयेऽपरे ।
श्वेतश्च हेमकूटश्च हिमवान् शृंगवांश्चयः ॥ २५ ॥
तेषां मध्ये जनपदास्तानि वर्षाणि सप्त वै ॥ २६ ॥
इदं हैमवतं वर्षं भारतं नाम विश्रुतम् ।
हेमकूटं परं तस्मान्नाम्ना किंपुरुषं स्मृतम् ॥ २८ ॥
नैषधं हेमकूटं तु हरिवर्षं तदुच्यते ।
हरिवर्षात्परं चैव मेरोश्च तदिलावृतम् ॥ २९ ॥
इलावृतात्परं नीलम् रम्यकं नाम विश्रुतम् ।
रम्यात्परतरंश्वेतं विश्रुतं ताद्धिरण्मयम् ।
हिरण्मयात्परम् चापि शृंगवांस्तु कुरु स्मृतं ॥ ३० ॥
धनुःसंस्थे च विज्ञेये द्वे वृत्ते दक्षिणोत्तरे ।
दीर्घाणि तत्र चत्वारि मध्यमं तदिलावृतम् ॥ ३१ ॥
अर्वाक् च निषधस्याथ वेद्यर्धं दक्षिणं स्मृतम् ।
परं नीलवतो यच्च वेद्यर्धं तु तदुत्तरम् ।
वेद्यर्धे दक्षिणे त्रीणि वर्षाणि त्रीणिचोत्तरे ॥ ३२ ॥
तयोर्मध्ये तु विज्ञेयं मेरुमध्यमिलावृतम् ॥ ३३ ॥
(*Vāyu Purāṇa*, Chapter 34).

[*Translation.*—(See the map given below.) The Neela, the Nishadha, and the others that are lesser than them, the Sweta, the Hemakoota, the Himavān, and that which is the Sṛingavān: between these are the seven countries called वर्षs. This is the well-known country named Bhārata, which is near (to the South of the Himavān). Thence is the country named Kimpurusha (Tibet) near (to the South of) Hemakoota (Karakoram Mountains). Thence is the country named Harivarsha (Tartari) near (to the South of) Nishadha (Irekha Birga Mountain) and near Hemakoota (to the North of Hemakoota). Thence (to the West) is the country named Ilāvṛita, belonging to Meru (round the Meru). Thence (to the West of Ilāvṛita) is the country named Ramyaka near Neela

Indians settled in the Pamir Plateau in about 10102 B.C. This conclusion is also supported by the observations of Lokamānya Tilak.[5] It is also confirmed by the conclusion already arrived at that the Divine Kṛita might have begun in 10102 B.C. (see *supra*, paragraph 347).

(North of Neela or the Suleman Mountains). Thence (to the East of Ramyaka) is the country named Hiraṇmaya (Mongolia or Gobi) near Śweta (South of Śweta or Thianshan Mountains). Thence (to the North-West of Hiraṇmaya) is the country named Kuru near Śṛingavān (Hindukush Mountains). The two countries of the North and the South namely the Uttara Kuru and the Bhārata Khaṇḍa are of the form of a bow (whose string is pulled); the other four are long (like a long rectangle) and Ilāvṛita is the central (circular ?) country. That half of the Vedee (continent) which is on this side (Southern side) of the Nishadha is called the Southern half of the Vedee; that half of the Vedee which is beyond (to the North of) Neela is called the Northern half of the Vedee. There are three countries in the Southern half of the continent and there are three countries in the Northern half of the continent and between the two halves of the continent is the Ilāvṛita, in the centre of which lies the Meru.]

This description identifies the Meru with the Pamir Plateau; for, nowhere else in the North of India do we have six mountains starting from the same central region. It should be noted that this Geographical Meru is different from the Astronomical Meru or the North Pole. The astronomers borroweed their name of the North Pole from Geography and hence a great deal of confusion has followed.



[5] See page 453 of *The Arctic Home in the Vedas.*

354. We know nothing about the history of the period between 10102 B.C. and 3102 B.C. It appears however that during this period the Āryas spread from the Pamir into Russian Turkasthan, Afghanisthan and the Punjab.

HISTORY OF THE BRAHMĀVARTA

355. The beginning of the Vārāha Kalpa (3102 B.C.) is also the date of the establishment of the rule of a Brahmā, named Ānanda. This is shown by the following passage:—

भवस्तु प्रथमः कल्पो लोकादौ प्रथितः पुरा ।
ज्ञातव्यो भगवान् यत्र आनंदः सांप्रतः स्वयम् ॥ १८ ॥
ब्रह्मस्थानमिदं दिव्यं प्राप्तवान्[6] दिव्यसंभवं ॥ १९ ॥[7]

[*Translation.*—"Bhava should be known to be the formerly famous first Kalpa in the beginning of the world. In this Kalpa the present Brahmā, Ānanda, himself obtained the divine office of Brahmā of divine origin."]

356. The context of this passage

"वाराहः सांप्रतस्तेषां । तस्य वक्ष्यामि विस्तरम् ॥"

shows that this Bhava is the first small Kalpa of the Vārāha Mahākalpa. So, the passage means that Ānanda, himself assumed the office of a Brahmā (supreme authority in the State) in 3102 B.C. This Ānanda is again referred to in verse 50 of Chapter 23 and is said to be of the Gotra of Gālavya. In verse 48 of the same chapter it is stated that the 33rd Kalpa was going on since he obtained the office of a Brahmā

(ब्रह्मस्थानमिदं चापि यदा प्राप्तं त्वयाविभो ।
ततः प्रभृति कल्पश्च त्रयस्त्रिंशत्तमोह्यसौ ॥ ४८ ॥)

This confirms our translation of the 29th verse of Chapter 21 quoted above, and shows that Ānanda established in

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[6] *Note.*—The reading here is "प्राप्तवा". But that is not correct; for in that case its subject Ānanda ought to be in the third case while it is really in the first case and वा becomes superfluous as its meaning does not fit in here. I have, therefore, adopted the reading "प्राप्तवान्".

[7] *Vāyu Purāṇa*, Chapter 21.

3102 B.C. a State, in which he acted as the supreme authority. This is confirmed by the *Mahābārata*; for, it tells in Chapter 59 of *Śānti Parva* in verses 13–30 that a kingdom was established by Brahmā in the Kṛita Yuga in the beginning after a period of anarchy

(" यथाराज्यं समुत्पन्नमादौ कृतयुगेऽभवत् ")

This Brahmā was also called Swayambhū which means nothing else than that he established himself as a supreme ruler by his own efforts and did not inherit his authority from anybody else.

357. What was the country in which Ānanda became a Brahmā in the beginning of the Vāraha Kalpa? The country between the Sarasvatī and the Dṛishadvatī, *i.e.*, the present Ambāla district was created by Gods and is called the Brahmāvarta.[8] The name Brahmāvarta shows that it is the country where the supreme authority was named the Brahmā. It follows that Ānanda, the first Brahmā, must have ruled the country now called Brahmāvarta.

358. The institutions established by the Brahmā Ānanda will now be enumerated. A new system of the Yajñas seems to have been established by him. This is shown by the following passage in the *Taittirīya Brāhmaṇa*

" प्रजापतिः[9] रोहिण्यामग्निमसृजत । तं देवा रोहिण्यामादधत " ॥

[*Translation.*—"The Prajāpati created Agni, *i.e.*, the Yajña in the Rohiṇī constellation. The Gods, therefore, consecrated it in the Rohiṇī constellation."]

The reason for the statement that fire was created in the Rohiṇī, is that the Vernal Equinox being then in the Rohiṇī, the Rohiṇī was the first constellation of the year. The date of the Vernal Equinox being in the Rohiṇī is 3102 B.C. and that is also the date when Ānanda started his rule. Therefore,

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[8] *Manu Smṛiti*, Chapter 2, verses 17 & 19.

[9] See I. 1. 2.

this Prajāpati, who created fire, *i.e.*, the system of the Yajñas could be no other than Ānanda.

359. The following passage in the *Mahābhārata* also shows that a new system of Yajñas was created in 3102 B.C.

ततो देवयुगेऽतीते देवा वै समकल्पयन् ।
यज्ञम् वेदप्रमाणेन ....॥ १ ॥[10]

[*Translation.*—"At the end of the Divine Yuga, the Devas devised the Yajña to be proportionate to the Vedas. We have come to know from the discussion in *supra*, paragraph 347, that the Divine Tretā ended in 3102 B.C. Therefore, this statement can mean that this system of the Yajñas was created in 3102 B.C., of course, by Ānanda."]

360. A system of chronology is a necessary adjunct of the Yajña. Ānanda, must, therefore have instituted the system of chronology which began in 3102 B.C. and the elements of which we have already studied in the previous Lecture. The creation of the world (विश्व) referred to in the *Vāyu Purāṇa*, Chapter 2, verses 5–15,[11] and said to have been made presumably a thousand years before Purūravas, may have been the same as the institution of a new system of chronology by Ānanda.

361. Ānanda also established the Varṇas and enunciated their duties. This is clear from Chapter 8, verses 160–67, of the *Vāyu Purāṇa* (corresponding to Chapter 8, verses 151–60, of the *Brahmāṇḍa Purāṇa*). He also established the institution of marriage as shown hereafter.[12]

362. But these institutions of Ānanda did not, however, all continue to be in force for a very long time and after a period of abeyance were revived by the Swāyambhuva Manu. This will appear from the following passage:—

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[10] *The Mahābhārata*, *Sauptika Parva*, Chapter 18.

[11] See *supra*, para. 340.

[12] See *infra*, para. 364.

वर्णाश्रमव्यवस्थानं तेषां ब्रह्मा तथाऽकरोत् ।
पुनः प्रजास्तु ता मोहात्तान् धर्मान् न ह्यपालयन् ।
परस्परविरोधेन मनुं ताः पुनरन्वयुः ॥ ५६ ॥[13]

[*Translation.*—"Brahmā established the institutions of the Varṇas and the Āshramas for them. But the people did not follow these regulations on account of their folly. As a consequence, there were conflicts amongst themselves and therefore they again followed Manu (Swāyambhuva Manu)."]

363. The following passage also supports this conclusion:—

तत्र त्रेतायुगस्यादौ मनुः सप्तर्षयःश्च ये ।
श्रौतं स्मार्तं च धर्मं च ब्रह्मणाच प्रचोदितं ॥ ३९ ॥[14]
दाराग्निहोत्रसंयोगं ऋग्यजुःसामसंज्ञकम् ।
इत्यादिलक्षणं श्रौतं धर्मं सप्तर्षयोऽब्रुवन् ॥ ४० ॥
परंपरागतं धर्मं स्मार्तं चाचारलक्षणम् ।
वर्णाश्रमाचारयुतं मनुः स्वायंभुवोऽब्रवीत् ॥ ४१॥ [15]

[*Translation.*—"There in the beginning of the Tretā Yuga, the Manu and the Saptarshis enunciated the Śrouta and the Smārta Dharmas ordained by the Brahmā. The Saptarshis told the Śrouta Dharma consisting of marriage and Yajña (worship of Fire) also named Rik, Yajus and Sāman, and the Swāyambhuva Manu told the Smārta Dharma consisting of the rules of conduct of the Varṇas and the Āshramas that had been handed down by tradition."]

364. This passage from the *Vāyu Purāṇa* also gives us information about the institutions established by the Brahmā Ānanda. It informs us that marriage also was one of the institutions established by this Brahmā. This passage also suggests that the regulations of Ānanda did not continue in force very long. This is confirmed by the fact that only 33 small Kalpas corresponding to 132 years and no more are

[13] *Vāyu Purāṇa*, Chapter 57.
[14] *Ibid.*, Chapter 57.
[15] *Ibid.*, Chapter 57.

enumerated in the *Vāyu Purāṇa* since the beginning of the rule of the Brahmā Ānanda.[16] This suggests that the regulations of Ānanda were observed for 132 years only.

365. The two passages just discussed show that the institutions of Ānanda were revived by the Swāyambhuva Manu at the beginning of the Tretā Yuga. This date of the beginning of the rule of the Swāyambhuva Manu is stated more accurately in the following passage: —

कथं त्रेतायुगमुखे यज्ञस्यासीत् प्रवर्तनं ।
पूर्वं स्वायंभुवे सर्गे यथावत्प्रब्रवीहि मे ॥ ८६ ॥
अंतर्हितायां संध्यायां सार्धं कृतयुगेन वै ।
कलाख्यायां प्रवृत्तायां प्राप्ते त्रेतायुगे तदा ॥ ८७ ॥
वर्णाश्रमव्यवस्थानं कृतवंतश्च वै पुनः ॥ ८७ ॥[17]

[*Translation.*—"Tell us truly how the Yajña was started in the beginning of the Tretā Yuga in the creation (सर्गे) of the Swāyambhuva Manu. Tell us how they again established the Varṇas and the Āshramas when the Kṛita Yuga and the interim thereafter had ended, when the Tretā Yuga had arrived and when (the period) named Kalā had begun."]

366. Now we know that the period of the Kṛita is 400 years including its own interim. Then would follow the interim of the Tretā in its beginning, of the length of 30 years. This would make 430 years from the beginning of the Mahā-Kalpa named the Vārāha. But a new small Kalpa begins not at the end of 430 years but at the end of 432 years from the beginning of the Vārāha Kalpa and the Kalā mentioned here appears to be the same as the small Kalpa. Therefore the rule of the Swāyambhuva Manu must have begun 432 years after the beginning of the Mahā-Kalpa, *i.e.*, exactly 300 years after the regulations of the Brahmā Ānanda, ceased to be observed as seen already. Curiously enough this agrees exactly with the statement of Megasthenes given in the previous

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[16] See Chapters 21-22.

[17] *Vāyu Purāṇa*, Chapter 57,

Lecture.[18] There a republic extending over a period of 300 years has been mentioned and here also we have a period of 300 years in which the regulations of Ānanda appear to be in abeyance and in which no king is known to have ruled. We may, therefore, infer that from 132 Kalpa Era to 432 Kalpa Era, there was a republic. Anyhow, it is certain that the Swāyambhuva Manu established his rule in 432 Kalpa Era, reviving the institutions of Ānanda.

367. The Swāyambhuva Manu was followed by eighteen kings of his line. They are:—

(1) Uttānapāda (उत्तानपाद)
(2) Dhruva (ध्रुव)
(3) Pushṭi (पुष्टि)
(4) Prācheenagarbha (प्राचीनगर्भ)
(5) Udāradhee (उदारधी)
(6) Divanjaya (दिवंजय)
(7) Ripu (रिपु)
(8) Chakshusha (चक्षुष)
(9) Chākshusha Manu (चाक्षुष मनु)
(10) Ūru (ऊरु)
(11) Anga (अंग)
(12) Vena (वेन)
(13) Pṛithu (पृथु)
(14) Antardhi (अंतर्धि)
(15) Havirdhāna (हविर्धान)
(16) Prāchīna Barhish (प्राचीन बर्हिष्)
(17) Prachetas (प्रचेतस्)
(18) Daksha (दक्ष)[19]

368. The date of the Chākshusha Manu can be found out exactly by astronomical calculation from the following statement in the *Vāyu Purāṇa*:—

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[18] See *supra*, para. 217.

[19] See Chapters 62 & 63 of the *Vāyu Purāṇa*.

विवस्वानदितेः पुत्रः सूर्यो वै चाक्षुषेंऽतरे ।
विशाखासु समुत्पन्नः ग्रहाणाम् प्रथमोग्रहः ॥ १०४ ॥
त्विषिमान् धर्मपुत्रस्तु सोमो विश्वावसुस्तथा ।
शांतरश्मिः समुत्पन्नः कृत्तिकासु निशाकरः ॥ १०५ ॥
षोडशार्चिर्भृगोः पुत्रः शुक्रः सूर्यादनंतरम् ।
ताराग्रहाणां प्रवरः तिष्यक्षेत्रे समुत्थितः ॥ १०६ ॥
ग्रहश्चांगिरसः पुत्रोद्वादशार्चिर्बृहस्पतिः ।
फल्गुनीषु समुत्पन्नः सर्वासु च जगद्गुरुः ॥ १०७ ॥
नवार्चिर्लोहितांगस्तु प्रजापतिसुतोग्रहः ।
आषाढास्विह पूर्वासु समुत्पन्न इति श्रुतिः ॥ १०८ ॥
रेवतीष्वेव सप्तार्चिस्तथासौरः शनैश्चरः ।
रेवतीषु समुत्पन्नौ ग्रहौ चंद्रार्कमर्दनौ ॥ १०९ ॥[20]

There is another reading "रोहिणीषु" for "रेवतीषु" in the third Pāda of the verse 109; the word "सर्वासु" in verse 107 gives no rational meaning and hence I have adopted the reading "पूर्वासु" of which "सर्वासु" can be a mis-reading. The reading "पूर्वासु" is also found in the corresponding verse of the *Brahmāṇḍa Purāṇa*, Chapter 24, verse 132. The meaning of the passage is that at the time of the Chākshusha Manu, the Sun was born in the Viśākha, the Moon in the Kṛittikā, the Venus not distant from the Sun in the constellation on which the Pushya had an aspect (तिष्यक्षेत्रे), namely in the constellation Swāti, the seventh from the Pushya, the Jupiter in the Poorvā Falguni, the Mars in the Poorvā Āshadhā, the Saturn in the Revatī and the Rāhu and the Ketu in Revatī (Rohiṇee). The statements that the planets were born in these constellations is clearly poetical. It only means that they were in those constellations when the period of Chākshusha Manu began. Therefore when the period began the approximate longitude of the Moon was about 40°, that of the Sun about 220°, that of the Jupiter about 145°, that of the Saturn 0°, that of the Mars 255° and

[20] *Vāyu Purāṇa*, Chapter 53.

that of the Rāhu 0° or 50°. The mean positions of these are also as follows:—

Planet		Mean Longitude in degrees
Sun	..	221
Jupiter	..	133
Saturn	..	9
Mars	.	280

369. The positions of the planets of the Zero-date have been given in the Second Lecture.[21] 0·385 Years before that, we get the following mean longitudes, of the planets:—

Planet		Mean Longitude in degrees
Sun	..	221
Jupiter	..	176
Saturn	..	44
Mars	..	293·2

The Saturn would take about 3 years to go from longitude 9° to longitude 44° and the Jupiter would take about 1·5 years to go from longitude 133° to longitude 176°. Therefore we get the following equations :—

$$+3\cdot00+29\cdot456624\times\text{(complete revolutions of the Saturn)} = T-0\cdot385$$

and

$$+1\cdot50+11\cdot861764\times\text{(complete revolutions of the Jupiter)} = T-0\cdot385$$

[21] See *supra*, para. 82.

(In these calculations the years before the Zero-date are regarded as *plus*.) Therefore,

$$\frac{+1\cdot50+29\cdot455624\times(\text{Complete revolutions of the Saturn})}{11\cdot861764}$$

= Complete revolutions of the Jupiter

Or approximately,

$$\frac{8+149\times(\text{complete revolutions of the Saturn})}{60}$$

= Complete revolutions of the Jupiter.

370. We get several solutions of this indeterminate equation. But 68 revolutions of the Saturn is the solution that would serve our purpose. This gives:

$T = 68 \times 29\cdot456624 + 3\cdot00 + 0\cdot385 = 2006\cdot435$ years.

But as we have seen, the Saturn and the Jupiter come to the same position again after 913·35 years or 59·308 years. We, therefore, get the following years:—

1. 3097·7
2. 3038·4
3. 2979·1
4. 2919·8
5. 2860·5
6. 2801·2

Now the mean longitude of the Mars was 293° when that of the Sun was 221° just before the Zero-date. This is almost just what we require. The Mars and the Sun come to the same position again after 15, 17, 19, 32, 45, 47, 49, 64, 89, 158, 188, 224 or 363 years. Therefore we will get the desired position of the Mars in $0 + 0\cdot385 + 8 \times 363$ or 2904·385 and we get the desired position of the Mars, the Jupiter and the Saturn in the year 2919·385 only.

371. The positions of the planets calculated in this year are as follows:—

Planet		Mean Longitude in degrees	True Longitude in degrees	Constellation
Sun	..	216	215	Viśākhā
Moon	..	26	..	..
Mars	..	295	265	Poorvāshāḍhā
Venus	..	156·4	192	Swāti
Jupiter	..	145	155	Poorvāfalgunī
Saturn	..	13	4	Revatī
Rāhu	..	347	347	Revatī

The longiude of the true Moon would be about 37° at the end of the Paurṇimā, *i.e.*, the Moon would be in the Kṛittika.

This agrees exactly with what the *Vāyu Purāṇa* states. The date of the beginning of the period of Chākshusha Manu is, therefore, 680·6 years Kalpa Era. This agrees well with the number of generations (that is 9) between the Swāyambhuva Manu and the Chākshusha Manu.

372. The date of Daksha also can be accurately ascertained. The story of the destruction of the Daksha's Yajña by Mahādeva seems to be an allegory based upon the omission of a day every 28th quaternary. Such a day was, of course, omitted from the 381 days of the Aśwamedha given before. This omission must have changed the usual form of the Yajña and given rise to the idea of its destruction. This is clear from the following :—

(1) The same things, namely, omission of invitation to Mahādeva and his wife and obstacle in the Yajña created by Mahādeva's wife, happened at the Yajña of both the Dakshas, namely the Daksha, the comtemporary of the Swāyambhuva Manu and the Daksha who was son of Prachetas. Daksha is represented to have said to Mahādeva

that he will create opposition to him, even in his subsequent birth as the son of Prachetas, so that Brāhmaṇas will not worship him in the sacrifice. This also shows that the same things were repeated in the Yajñas of both the Dakshas. If the story of the destruction of Daksha's Yajña were not an allegory, one could hardly expect the same things to happen again.

(2) The Rathantara Sāma was being sung in the Yajña of Daksha—the Sāma which has the same name as the group of 28 Kalpas, in the last of which one day was omitted.

(3) Mahādeva states while consoling his wife for the omission of invitation to him, that the worshippers omitted to invite him by virtue of the decision of the Gods and in accordance with the traditional rules of Dharma and that though they did not invite him, they were really praising him. If the story was not an allegory, Mahādeva would simply have been represented as saying that he was not invited because of hatred and the Brāhmaṇas also would not at the sacrifice worship or praise one who was deliberately excluded on account of hatred.

373. These facts appear from the following passages:—

सर्वे प्रचेतसोनाम धनुर्वेदस्य पारगाः ।
तेषां स्वायंभुवो दक्षः पुत्रत्वे जज्ञिवान् प्रभुः ।
त्र्यंबकस्याभिशापेन चाक्षुषस्यांतरे मनोः ॥ ३७ ॥

महादेव उवाच

भविता चाक्षुषो राजा चाक्षुषस्य समन्वये ।
प्राचीनबर्हिषः पौत्रः पुत्रश्चैव प्रचेतसः ॥ ६० ॥
दक्ष इत्येव नाम्नात्वं प्राप्ते वै चाक्षुषेंतरे ॥ ६१ ॥

दक्ष उवाच

अहं तत्राऽपि ते विघ्नं आचरिष्यामि दुर्मते ।
तस्मात्सार्धं सुरैर्यज्ञे न त्वां यक्ष्यंति वै द्विजाः ॥ ६३ ॥

महादेव उवाच

दक्षोनाम महाभागे प्रजानां पतिरुत्तमः ।
हयमेधेन यजते तत्र यांति दिवौकसः ॥ ११० ॥

देव्युवाच

यज्ञमेतं महाभाग किमर्थं न गतोऽसि वै ॥ १११ ॥

महादेव उवाच

सुरैरेव महाभागे सर्वमेतदनुष्ठितम् ।

यज्ञेषु मम सर्वेषु न भाग उपकल्पितः ॥ ११२ ॥

पूर्वोपायोपपन्नेन मार्गेण वरवर्णिनी ।

न मे सुराः प्रयच्छंति भागं यज्ञस्य धर्मतः ॥ ११३ ॥

मामध्वरे शंसितारः स्तुवंति ।

रथंतरं साम गायंति गेयम् ॥

मा ब्राह्मणा ब्रह्मसत्रे यजंति ।

ममाध्वर्यवः कल्पयंते च भागं ॥ ११४ ॥[22]

[*Translation.*—" During the period of the Chākshusha Manu, Daksha, contemporary of the Swāyambhuva Manu, was born (again) as the son of Prachetas by the curse of Tryambaka (Mahādeva). Mahādeva said to Daksha—'When the period of the Chākshusha Manu will come, you will be born (again) as a King in the line of the Chākshusha Manu being named Daksha, as the son of Prachetas and the grandson of Prācheena Barhish.' Daksha said to Mahādeva, ' Oh Villain, in that life also I will create opposition to you and therefore, the Brāhmaṇas will not worship you in the Yajña along with other Gods.' Mahādeva said to his wife, ' The best King of the people, named Daksha, is performing the Aśvamedha Yajña and Gods are going there.' The Goddess (the wife of Mahādeva) said to Mahādeva, ' Oh my Lord, why did you not go to this Yajña.' Mahādeva replied, ' My dear, all this has been done by the Gods themselves. They have not devised an oblation to me in all the Yajñas. The Gods do not offer oblations to me in accordance with the traditional rules of Dharma. The worshippers praise me in the Yajña. They sing the Rathantara Sāma (song). The Brāhmaṇas worship me in the Brahma Satra and Adhvaryus offer oblations to me."]

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22 *Vāyu Purāṇa*, Chapter 30.

374. It follows that a day was omitted in the Aśvamedha of Daksha and that, therefore, his date must have been 896 of the Kalpa Era. This agrees well with the generations (that is 9) between the Chākshusha Manu and the second Daksha. The date of the Yajña of that Daksha, who was the contemporary of the Swāyambhuva Manu, would, of course, be 448 of the Kalpa Era.

375. Vena the twelfth of the line of the Swāyambhuva Manu, was a tyrannous king. He was, therefore, deposed and his son Pṛithu was enthroned in his place. Pṛithu was made to take an oath that is given in the following statement:—

प्रतिज्ञां चाधिरोहस्व कर्मणा मनसा गिरा ।
पालयिष्याम्यहं भौमं ब्रह्म इत्येव चासकृत् ॥ १०६ ॥
यश्चात्र धर्मो नित्योक्तो दंडनीतिव्यपाश्रयः ।
तमशंकः करिष्यामि स्ववशो न कदाचन ॥ १०७ ॥
अदंड्या मे द्विजाश्चेति प्रतिजानीहि हे प्रभो ।
लोकं च संकरात्कृत्स्नं त्रातास्मीति परंतप ॥ १०८ ॥[23]

[*Translation.*—"Take this oath again and again (thrice):—'I will protect the Brahma on the Earth (the Brāhmaṇas) by action, mind and words; I will not act at any time according to my own inclinations but will doubtless act according to the unchangeable Dharma laid down in the *Danda-Neeti*; Oh, Lord also make this promise: I will not punish the Brāhmaṇas and I will also protect the whole world from the admixture of the Varṇas."]

This oath is as skilfully framed and is as significant as the oath which the constitutional monarch of England has to take. The Brāhmaṇas were to be protected and exempted from punishment; for, they were the legislators and the judges of those days. Even to-day the legislators and the judges enjoy special protection in the constitutions of civilized countries.

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[23] *Mahābhārata, Sānti Parva*, Chapter 59.

Pṛithu is said to have been a good king. He encouraged cultivation, commerce and cattle-breeding and building of cities.[24]

376. Daksha, the 18th King in the line of the Swāyambhuva Manu, had no male progeny. Vaivasvata Manu, the grandson of his daughter, suceeded him in 952 Kalpa Era[25] so that Daksha must have had a very long reign from 896 Kalpa Era to 952 Kalpa Era.

377. This date 952 Kalpa Era is obtained in the following way:—We have already shown that the Manus were public functionaries. One of the functions of the Manus was the redistribution (वर्णविभाग) of the Varṇas. The period of the Manu was four years as shown already; but the redistribution of the Varṇas was not made by every Manu. Therefore, every Manu is not remembered. Only those are remembered who redistributed the Varṇas and they are fourteen. The period of such Manus was said to continue until fresh redistribution of the Varṇas was made by a subsequent Manu. Such periods became very long after the Raivata Manu, probably because the Raivata Manu introduced some rules by which a man could go automatically from one Varṇa to another and thereafter the Manus redistributed the Varṇas only under the most exceptional circumstances. As already shown the period of the Chākshusha Manu was 68 Yugas, *i.e.*, 272 years, and this period began in 680 Kalpa Era.[26] Therefore the period of the Vaivasvata Manu must have begun in 952 Kalpa Era.

378. The Purāṇas give the dynasties of only three sons of the Vaivasvata Manu, namely :—Ikshvāku, Nimi and Nābhāgārishṭa.

The descendants of Ikshvāku ruled in Ayodhyā and those of Nimi in Behar. This suggests that the descendants of

[24] *Vāyu Purāṇa*, Chapter 62, verses 167–74.
[25] *Ibid.*, Chapter 84, verses 31–38 and verse 1 of Chapter 85.
[26] See *supra*, para. 371.

Nābhāgārishṭa must have ruled in Brahmāvarta and also that at this period the Āryas must have begun to expand out of the Brahmāvarta to the East and the South, the expansion to the South being made by Manu's grandson Purūravas.[27]

The kings of the line of Nābhāgārishṭa are :—

1. Nābhāgārishṭa (नाभागारिष्ट)
2. Bhalandana (भलंदन)
3. Prānśu (प्रांशु)
4. Prajāni (प्रजानि)
5. Khanitra (खनित्र)
6. Kshupa (क्षुप)
7. Vinśa (विंश)
8. Vivinśa (विविंश)
9. Khanīnetra (खनीनेत्र)
10. Karandhama (करंधम)
11. Avikshit (अविक्षित्)
12. Marutta (मरुत्त)
13. Narishyanta (नरिष्यंत)
14. Dama (दम)
15. Sudhṛiti (सुधृति)
16. Nara (नर)
17. Kevala (केवल)
18. Bandhumān (बंधुमान्)
19. Vegavān (वेगवान्)
20. Budha (बुध)
21. Tṛiṇabindu (तृणबिंदु)[28]

379. It is said of Tṛiṇabindu that he ruled in the third quaternary of the Tretā Yuga, of course, the second Tretā Yuga[29] (त्रेतायुगमुखे राजा तृतीये) and that his descendants ruled in Viśālā, *i.e.*, Ujjayinee. It, therefore, appears that either

[27] See *infra*, para. 396.
[28] *Vāyu Purāṇa*, Chapter 86.
[29] *Ibid.*, Chapter 86, verse 15.

Triṇabindu left the Kingdom of the Brahmāvarta or that he was deposed between 1408 and 1412 Kalpa Era.

A republic then appears to have been established and Hiraṇyakaśipu became the Indra, *i.e.*, supreme authority in the Brahmāvarta in the fourth quaternary of the Tretā Yuga:

(चतुर्थ्यां तु युगाख्यायां आपन्नेष्वसुरेष्वथ ।
संभूतः स समुद्रांतर्हिरण्यकशिपोर्वधे ॥ ७२ ॥[30])

But there were then two parties in the State, the Asuras and the Devas and they fought many (twelve) battles for capturing the supreme power in the State

(तेषां दायनिमित्तं वै संग्रामा बहवोऽभवन् ।
वाराहेऽस्मिन् दश द्वौ च षंडामर्कांतगाः स्मृताः ॥ ७२ ॥[31])

Hiraṇyakaśipu belonged to the former party. He was killed by Narasinha of the party of the Devas and then the Asura Bali became the Indra between 1424 and 1428 Kalpa Era

(बलिसंस्थेषु लोकेषु त्रेतायां सप्तमे युगे ॥ ७४ ॥[32])

Bali appears to have been driven out of the Brahmāvarta by Wāmana of the party of the Devas and then the Asura Prahlāda became the Indra.[33]

These three Indras of the Asura party held office for ten quaternaries, *i.e.*, 40 years

(इंद्रास्त्रयस्ते विख्याता असुराणां महौजसः ।
दैत्यसंस्थमिदं सर्वं आसीद्दशयुगम् किल ॥ ९१ ॥[34])

At the end of this period, the Devas appear to have defeated the Asuras and to have driven them out to Pātāla, *i.e.*, perhaps to Babylon and then the Devas held the office of the Indra for 40 years only

[30] *Vāyu Purāṇa*, Chapter 98.
[31] *Ibid.*, Chapter 97.
[32] *Ibid.*, Chapter 98.
[33] See Chapters 97 and 98 of the *Vāyu Purāṇa*.
[34] *Vāyu Purāṇa*, Chapter 97.

(असपत्नं ततः सर्वं राष्ट्रं दशयुगं पुरा ।
त्रैलोक्यमव्ययमिदं महेंद्रेण तु पाल्यते ॥ १२ ॥[35])

Thus this second republic appears to have continued for 80 years. This corresponds to the second republic of 120 years mentioned by Megasthenes.[36] (He may have given 120 years on account of some misunderstanding).

380. Māndhātā (मांधाता) appears to have become King in the Brahmāvarta in 1492 Kalpa Era. This is inferred from the statement of Indra that Māndhātā will suck milk from his finger[37] and from the fact that the Indra of the Devas is said to have ruled for 40 years only. Māndhātā's birth took place in the 15th quaternary of the Tretā Yuga, *i.e.*, between 1456 and 1460 of the Kalpa Era.[38]

381. The Kings of the line of Māndhātā who ruled in the Brahmāvarta are probably the following:—

1. Māndhātā (मांधाता)
2. Purukutsa (पुरुकुत्स)
3. Trasadasyu (त्रसदस्यु)
4. Sambhūta (संभूत)
5. Anaraṇya (अनरण्य)
6. Trasadaśva (त्रसदश्व)
7. Haryaśva (हर्यश्व)
8. Vasumata (वसुमत)
9. Tridhanvā (त्रिधन्वा)
10. Trayyaruṇa (त्रय्यारुण)
11. Satyavrata (सत्यव्रत) or Triśanku (त्रिशंकु)
12. Hariśchandra (हरिश्चंद्र)
13. Rohita (रोहित)
14. Harita[39] (हरित)

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[35] *Vāyu Purāṇa*, Chapter 97.
[36] See *supra*, para. 217.
[37] *Mahābhārata, Vana Parva*, Chapter 126, verse 30.
[38] *Matsya Purāṇa*, Chapter 47; see *supra*, para. 279.
[39] See *Vāyu Purāṇa*, Chapter 88.

We say that these kings ruled in the Brahmāvarta; because they succeeded Māndhātā according to the list in the *Vāyu Purāṇa* and also because many of them are referred to in the Vedas.[40]

382. Harita's son Champu is said to have created a new city named Champā[41] and only a few descendants of Champu are given in the Purāṇas. It therefore appears that after Harita a third republic was established in the Brahmāvarta. That republic was in existence in the days of the Mahābhārata War and continued to exist upto the time of Megasthenes and it was perhaps on this account that he could not give the period of this third republic. The Indras referred to in the *Mahābhārata* were, of course, the heads of the Brahmāvarta during this third republic.

No further history of the Brahmāvarta can be known from the Purāṇas. That State evidently became absorbed later on in the Magadha Empire.

383. The Brahmāvarta was the first, the foremost and the ideal State of the Āryas. It was the State in which the Aśvamedha was performed, the Vedas were composed in every quaternary for the Aśvamedha and where the Manus were appointed for enacting laws and redistribution of the Varṇas. When new Kingdoms of Ayodhyā, Behar, Kurukshetra, etc., were established, they first looked up to it as their ideal and guide. But as the importance of these new States increased that of Brahmāvarta declined. The Aśvamedha began to be performed in other States and the Manus and the Indras also began to be appointed from them.

384. Bali was the Indra when the eighth Manu named Sāvarṇa (सावर्ण) was appointed.[42] Therefore the date of Sāvarṇa Manu must be about 1424 Kalpa Era. The subsequent Manus were from outside the Brahmāvarta and we shall have to investigate about them later on.

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[40] See *Prācheena Charitra Kosha* by Chitrāvaśāstree.

[41] See *Bhāgavata*, Skandha 9, Chapter 8, verse 1.

[42] See *Vāyu Purāṇa*, Chapter 100, verses 20–21.

385. Before finishing the history of the Brahmāvarta we shall find out the date of the first compilation of the *Vāyu Purāna*. We have already referred to the verse

अष्टाविंशद्युगाख्यास्तु गता वैवस्वतेंतरे[43]

which mentions that 28 Yugas of the period of the Vaivaśvata Manu had passed, of course, till the time at which the author was speaking. This shows that the first compilation of the *Vāyu Purāna* was made when 28 Yugas of the period of the Vaivasvata Manu had passed, *i.e.*, in 952 *plus* 112 or 1064 Kalpa Era.

HISTORY OF AYODHYA

386. It is stated in the *Rāmāyaṇa*[44] that the Vaivaśvata Manu established Ayodhyā and that his son Ikshwāku was the first king of Ayodhyā. This, of course, must have happened some time after 952 Kalpa Era. The line of kings between Ikshvāku and Śree Rāma is much confused, the Purāṇas giving 63 or 52 kings between them and the *Rāmāyaṇa* itself giving only thirty-five kings.[45] But we have already shown that Śree Rāma was born in 1493 Kalpa Era. Therefore there can be only about 25 generations between Ikshvāku and Śree Rāma. This conclusion is confirmed by the fact that all the Purāṇas and the *Rāmāyaṇa*[46] agree in giving twenty-three generations between the Vaivaśvata Manu and Seeradhvaja, the father-in-law of Śree Rāma. It is clear that this confusion is caused by the inclusion in the main line of kings of branch lines, ruling in places other than Ayodhyā. This is shown by the inclusion in this line of Shrāvasta and Champu who are said to have established other cities and, of course, kingdoms. They were included in this line because they were also the descendants of Ikshvāku. Māndhātā and his descendants ruled in the Brahmāvarta but they too have been given in this line. The line in

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[43] See *supra*, para. 267.
[44] Sargas, 5 and 70 of *Bāla Kāṇḍa*.
[45] See *Bāla Kāṇḍa*, Sarga 70.
[46] *Ibid.*, Sarga 71.

the *Rāmāyaṇa* is obviously the most reliable but we ought to exclude from it eleven kings from Kalmāshapāda to Nābhāga; for some of them have been mentioned by the Purāṇas as having ruled after Śree Rāma and the others have not been mentioned at all in the Purāṇas. We, therefore, think that the line of Ayodhyā was as follows:—

1. Ikshvāku (इक्ष्वाकु)
2. Kukshi (कुक्षि)
3. Vikukshi (विकुक्षि)
4. Bāṇa (बाण)
5. Anaraṇya (अनरण्य)
6. Pṛithu (पृथु)
7. Triśanku (त्रिशंकु)
8. Dhundhumāra (धुंधुमार)
9. Yuvanāśva (युवनाश्व)
10. Māndhātā (मांधाता)
11. Susandhi (सुसंधि)
12. Dhruvasandhi (ध्रुवसंधि)
13. Bharata (भरत)
14. Asita (असित)
15. Sagara (सगर)
16. Asamanjas (असमंजस्) (he was not made a King).
17. Anśumān (अंशुमान्)
18. Dileepa (दिलीप)
19. Bhageeratha (भगीरथ)
20. Kakutstha (ककुत्स्थ)
21. Raghu (रघु)
22. Aja (अज)
23. Daśaratha (दशरथ)
24. Śree Rāma (श्री राम)

387. We have already found out the dates of several events in the life of Śree Rāma. They are as follows:— Birth 1493 Kalpa Era; Exile 1518 Kalpa Era, March from

Kishkindhā for Lankā 1530·6 Kalpa Era; Killing of Rāvaṇa 1531·1 Kalpa Era; Return to Ayodhyā would, of course, be 1532 Kalpa Era. We have now to find the date of his death. After return to Ayodhyā Śree Rāma ruled for 40 years and then died. This is shown by the statement that[47] Rāma performed ten Aśvamedhas (दशाश्वमेधानाजह्रे). As an Aśvamedha is performed every fourth year, this means that after return to Ayodhyā Śree Rāma lived for 40 years.

We should not be misled by the statements in the *Rāmāyaṇa*, for in it there is an attempt to deify Śree Rāma. Moreover the statement in the *Rāmāyaṇa*, *Yuddha Kaṇḍa*, last chapter

"राज्यं दशसहस्राणि प्राप्य वर्षाणि राघवः ॥ १४ ॥"

can be so construed as to support the above inference. We suggest that the word Sahasra had then probably two meanings derived from its original meaning. Its original meaning is "a time of rejoicing or festivity" for it is derived from हस् to laugh. There were then two important festivities— (1) the Aśvamedha at an interval of four years and (2) the Dwādaśa Vārshika Satra at an interval of a thousand years. The word Sahasra, therefore, may have come to mean a period of either four years or one thousand years. We get a rational meaning for the above statement from the *Rāmāyana* only if we take Sahasra to mean four years and this meaning agrees with the statement that Śree Rāma performed ten Aśvamedhas.

Thus the date of Śree Rāma's death appears to be 1572 Kalpa Era.

388. The line after Śree Rāma also is confused between Śree Rāma and Bṛihadbala who was killed by Abhimanyu in the Bhārata War.[48] The *Bhāgavata* gives 25 generations, while the *Vishṇu* and the *Vāyu* give 32 generations between them and the *Mastya* gives only 15 generations between Śree Rāma and the Bhārata War in Chapter 12. The cause of

[47] Chapter 291, verse 70, in *Vana Parva* in the *Mahābhārata*.
[48] *Mahābhārata*, *Droṇa Parva*, Chapter 47, verse 24.

this confusion must be the same as already suggested above. Four lines are available to us, one from each of the following four Purāṇas, namely the *Bhāgavata*, the *Vāyu*, the *Vishṇu*, and the *Harivanśa*. The line in the *Harivanśa* is clearly deficient; for according to it Manu was the father of Bṛihadbala and that is inconsistent with Manu's date, *i.e.*, 1772 Kalpa Era, found hereafter.[49] We shall, therefore, take the Kings that are common to the other three lists. They are as follows:—

1. Kuśa (कुश)
2. Atithi (अतिथि)
3. Nishadha (निषध)
4. Nabhasa (नभस)
5. Puṇḍareeka (पुंडरीक)
6. Kshemadhanvā (क्षेमधन्वा)
7. Devāneeka (देवानीक)
8. Aneeha or Aheenagu (अनीह, अहीनगु)
9. Pāriyātra (पारियात्र)
10. Hiraṇyanābha (हिरण्यनाभ)
11. Pushya (पुष्य)
12. Dhruvasandhi (ध्रुवसंधि)
13. Sudarśana (सुदर्शन)
14. Agnivarṇa (अग्निवर्ण)
15. Śeeghra (शीघ्र)
16. Manu or Maru (मनु, मरु)
17. Prasuśruta (प्रसुश्रुत)
18. Sugati, or Susandhi (सुगति, सुसंधि) or Sandhi (संधि).
19. Amarshaṇa (अमर्षण)
20. Mahaswān (महस्वान्)
21. Viśrutavān or Viśvasāhva (विश्रुतवान्, विश्वसाह्व)
22. Bhṛihadbala (बृहद्बल)

[49] See *infra*, para. 389.

389. The *Vāyu Purāṇa* makes the following statement about Manu of the line of Śree Rāma:

अग्निवर्णस्य शीघ्रस्तु शीघ्रकस्य मनुःस्मृतः ।
मनुस्तु योगमास्थाय कलापग्राममास्थितः ॥
एकोनविंशप्रयुगे क्षत्रप्रावर्तकः प्रभुः ॥ २१० ॥[50]

[*Translation.*—" Śeeghra was born of Agnivarṇa and Manu was born of Śeeghra. This Manu stayed at the town Kalāpa having got great authority as a State functionary (योग)[51] ; (by virtue of this authority) he brought Kshatriyas into existence in the 19th Yuga (quaternary) of the second Dwāpara Yuga (of course).]"

This gives us the date of this Manu to be 1772 Kalpa Era. This agrees well with the generations given above.

390. At the time of this Manu who was, of course, the ninth Manu, four different Manus of the four directions were appointed simultaneously. *Brahmāṇḍa Purāṇa* says:—

समतीतास्तु ये तेषां अष्टौ षट् च तथाऽपरे ।
पूर्वेषु सांप्रतश्चायम् शास्ति वैवस्वतः प्रभुः ॥ ३४ ॥[52]

[*Translation.*—" Eight Manus have passed and six others are yet to pass. At present, the desendant of Vaivaśvata is ruling amongst the Easterns."]

This statement refers to the ninth Manvantara and it says that a descendant of Vaivaśvata rules the Easterns. The word " Easterns " suggests that four Manus of four directions were appointed in this Manvantara. This is supported by the statement in the *Vāyu Purāṇa*[53] that four Manus, the Manasa Putras (adopted or nominated sons) of each of the four, namely Brahmā, Dharma, Daksha and Bhava, were born of Daksha's daughter all at once and therefore at one

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[50] *Vāyu Purāṇa*, Chapter 88.

[51] योग being derived from युज् to appoint, means 'appointment' and hence 'authority'.

[52] Pada 4, Chapter 1.

[53] *Vāyu Purāṇa*, Chapter 100, verses 40-54.

time (सद्य:) and by the statement in the *Bhagavadgeetā*, namely[54] महर्षय: सप्त पूर्वे चत्वारो मनव: in which there is a reference to four Manus that cannot be explained on any other theory. We, therefore, conclude that four Manus were appointed simultaneously in 1772 Kalpa Era and that Manu, the son of Śeeghra, was one of them.

391. The descendants of Bṛihadbala are as follows:—

1. Bṛihatkshaya (बृहत्क्षय)
2. Kshaya (क्षय)
3. Vatsavyūha (वत्सव्यूह)
4. Prativyūha (प्रतिव्यूह)
5. Divākara[55] (दिवाकर)
6. Sahadeva (सहदेव)
7. Bṛihadaśva (बृहदश्व)
8. Bhānuratha (भानुरथ)
9. Prateetāśva (प्रतीताश्व)
10. Suprateeta (सुप्रतीत)
11. Sahadeva (सहदेव)
12. Sunakshatra (सुनक्षत्र)
13. Kinnara (किन्नर)
14. Āntareeksha (आंतरीक्ष)
15. Suparṇa (सुपर्ण)
17. Amitrajit (अमित्रजित्)
16. Bharadwāja (भरद्वाज)
18. Dharmee (धर्मी)
19. Kṛitanjaya (कृतंजय)
20. Vrāta (व्रात)
21. Raṇanjaya (रणंजय)
22. Sanjaya (संजय)
23. Suratha (सुरथ)
24. Sumitra (सुमित्र)[56]

[54] Chapter 10, verse 6.

[55] Some Purāṇas call him दिवाक.

[56] *Vāyu Purāṇa*, Chapter 99.

We have omitted from this line six kings named Śākya (शाक्य), Śuddhodana (शुद्धोदन), Rāhula (राहुल), Prasenajit (प्रसेनजित्), Kshudraka (क्षुद्रक) and Kshulika (क्षुलिक). For we know that they were not the kings of Ayodhyā but of Kapilavastu. Moreover in Chapter 99, verses 322—325, the number of generations from the Bhārata War to the time of the writer of this portion of the *Vāyu Purāṇa* is said to be 26 in the Kuru line and 24 in the Ikshvāku line and yet while we actually find 26 Kings in the Kuru line, we find 30, *i.e.*, six more in the Ikshvāku line This shows that six kings of a branch line that ruled at a place other than Ayodhyā, of course, at Kapilavastu have been incorporated in the list of the main Ikshvāku line.

392. The kings Divākara and Suparṇa have been referred to in the following most important passage, from which we have to conclude that they were the Manus in the 10th and the 11th Manvantaras.

एतस्यां तु युगाख्यायां यतःक्षत्रं प्रपत्स्यते ।
तथाहि कथयिष्यामि गदतो मे निबोधत ॥ ४३६ ॥

देवापिः पौरवो राजा इक्ष्वाकोश्चापि यो मतः ।
महायोगबलोपेतः कलापग्राममास्थितः ॥ ४३७ ॥

सुवर्चाः सोमपुत्रस्तु इक्ष्वाकोस्तु भविष्यति ।
एतौ क्षत्रप्रणेतारौ चतुर्विंशे चतुर्युगे ॥ ४३८ ॥

नवविंशे युगे सोथ वंशस्यादिर्भविष्यति ।
देवापिरसपत्नस्तु ऐलादिर्भविता नृपः ॥ ४३९ ॥

क्षत्रप्रवर्तकौ ह्येतौ भविष्येते चतुर्युगे ।
एवं सर्वत्र विज्ञेयं संतानार्थे तु लक्षणम् ॥ ४४० ॥

क्षीणे कलियुगे तस्मिन् भविष्ये तु कृते युगे ।
सप्तर्षिभिस्तु तैः सार्धं आद्ये त्रेतायुगे पुनः ॥ ४४१ ॥

गोत्राणां क्षत्रियाणांच भविष्येते प्रवर्तकौ ।
द्वापरांशे न तिष्ठंति क्षत्रिया ऋषिभिः सह ॥ ४४२ ॥

कालें कृतयुगे चैव क्षीणे त्रेतायुगे पुनः ।
बीजार्थं ते भविष्यंति ब्रह्मक्षत्रस्य वै पुनः ॥ ४४३ ॥

एवमेव तु सर्वेषु तिष्ठंतीहांतरेषु वै ।
सप्तर्षयो नृपैः सार्धं संतानार्थं युगे युगे ॥ ४४४ ॥[57]

[[58] *Translation.*—" Listen, I shall tell you, how the Kshatriyas will come into existence in the periods named Yugas. Devāpi, the King of the line of Puru who is thought by some to be of the line of Ikshvāku, residing in the city named Kalāpa and having got great authority as a State functionary; and Suvarchas the son of Soma of the line of Ikshvāku, these two will be the creators of the Kshatriyas in the 24th quaternary and the 29th (39th if we adopt the reading नवत्रिंशे) quaternary (respectively). Devāpi of the line of Aila who will have no enemy will be the founder of a dynasty. These two shall be the creators of the Kshatriyas in the quaternary at the end of the Kali and in the future Kṛita Yuga (respectively) (it should be noted that this happens in all ages for the sake of continuity). With their respective Saptarshis they will be the creators of Gotras (Brāhmaṇas) and Kshatriyas. The Kshatriyas and the Ṛishis (the Brāhmaṇas) do not exist (cease to exist) in the first Tretā Yuga (this corresponds to the age of the Swāyambhuva Manu) and again in the interim of the Dwāpara (this corresponds to 680 Kalpa Era, the date of the Chākshusha Manu; for then the interim betweeen the Tretā and the Dwāpara extending from 670 to 720 Kalpa Era was going on) and in the Tretā Yuga after the Kṛita had ended (this corresponds to the 8th, *i.e.*, the Sāvarṇi Manu during whose period Bali was the Indra) and therefore again they will come into being for the sake of the origin of the Brahmaṇas and the Kshatriyas. In this way in all the periods, *i.e.*, in the

[57] *Vāyu Purāṇa*, Chapter 99.

[58] For the purposes of this translation we have to interchange the last Pāda of the 441st verse and the second Pāda of the 442nd verse. For the words " भविष्येते प्रवर्तकौ " in the 442nd verse, can be naturally related only to " क्षत्रप्रवर्तकौ ह्येतौ " in the 440th verse. This interchange has, therefore, been made while construing this passage.

Manvantaras, the Saptarshis with the kings (Manus) stand in all ages for the sake of continuity."]

393. This passage gives in a nut-shell the whole history of the Varṇas. It says that the Brāhmaṇas and the Kshatriyas ceased to exist at the dates mentioned in the passage and that they were then created by the Manus and the Saptarshis. This act is described as the distribution of the Varṇas (वर्णविभाग), in

वर्णानां प्रविभागश्च त्रेतायां संप्रकीर्तितः ॥ ६०॥ [59]

[*Translation.*—" It is said that the distribution of the Varṇas took place in the Tretā in the time of the Swāyambhuva Manu.] Therefore this creation means only selection. However this is not our proper subject. We are only concerned with the dates. The date of Devāpi is given as the 24th quaternary of Kali, *i.e.*, 1992–96 Kalpa Era and the date of Suvarçhas is given as the 29th or the 39th quaternary of the future Kṛita (the author is speaking in the second Dwādaśa Vārshika Satra), *i.e.*, 2112 to 2116 or 2152 to 2156 Kalpa Era. Devāpi is said to belong either to the line of the Purus or to the line of the Ikshvākus. It is well known that Devāpi of the Puru line, preceded the Pāṇḍavas and lived in the Dwāpara Yuga. Therefore, Devāpi who became a Manu must be another one and he can be identified with Divākara or Divāka in the line of Bṛihadbala if we take into consideration the curious changes in the names given in the Purāṇas. In the same way, we can identify Suvarchas with Suparṇa (also named Sutapas in some Purāṇas), the son of Āntarīksha, which can be the equivalent of Soma the Moon—Āntarīksha meaning " one in the sky ". But to make Suvarchas synchronize with Śuchi, the Indra,[60] in the last Manvantara, we have to take the reading नवात्रिंशे in place of नवविंशे which can be a misreading of it; for, Śuchi is a king of the Bārhadratha line of the Magadha and ruled in the Magadha,

[59] *Vāyu Purāṇa*, Chapter 57.

[60] *Bhāgavata*, Skandha 8, Chapter 13, verse 34.

as will be seen hereafter from 2130 to 2159 Kalpa Era. Thus the dates of the 10th and the 11th Manvantaras are 1992 to 1996 and 2152 to 2156 Kalpa Era respectively.

394. The following table gives for ready reference the dates of all the Manvantaras:—

No.	Name of the Manu	Date (Kalpa Era)	Date B.C.	Remarks
1	Swāyambhuva ..	432	2670	
2	Swārochisha ..	436	2666	These dates are only approximate
3	Uttama	440	2662	
4	Tāmasa	444	2658	
5	Raivata	448	2654	
6	Chākshusha ..	680	2422	
7	Vaivasvata ..	952	2150	
8	Sāvarṇi	1424	1678	
9	Son of Śeeghra and three others ..	1772	1330	In this period four Manus were appointed
10	Divākara ..	1992	1110	
11	Suparṇa ..	2152	950	

395. At the end of the rule of Sumitra the 24th in the line of Bṛihadbala the kingdom of Ayodhyā was absorbed in the Magadha Empire.

History of the Kurukshetra

396. Budha was the king in Bālhika (Balkha of the modern days). He married Ilā the daughter of the Vaivasvata Manu and established Prayāga or Pratishṭhāna to the North of the Yamunā (Jumna). Their son Purūravas then became the king there. This is the origin of the kingdom of the Kurukshetra.[61] We have seen that a Dwādaśa Vārshika Satra was performed during his reign. Therefore his date must clearly be about 1000 Kalpa Era. From 1000 Kalpa

[61] See *Rāmāyaṇa, Uttara Khāṇḍa*, Sarga 90, verses 17-21 and *Vāyu Purāṇa*, Chapter 91, verse 50.

Era to 1904·7, the date of the Bhārata War, we must get about 41 generations. The number of the generations between Ikshvāku and Bṛihadbala are 46 as we have seen and about as many must be the generations between Purūravas and the Pāṇḍavas. And we find that the generations given in the Purāṇas and Chapter 95 of the *Ādiparva* of the *Mahābhārata* are almost as many. There are, of course, minor differences between all these lists, the order of the kings is different and some names are different too.

397. Which of these lists shall we take to be the most reliable. The following passage from the *Harivanśa Purāṇa* furnishes us with a test

द्वावृक्षौ तव वंशेऽस्मिन् द्वावेव च परिक्षितौ ।
भीमसेनास्त्रयो राजन् द्वावेव जनमेजयौ ॥ १०४ ॥[62]

[*Translation.*—"Oh ! Janamejaya, in your line there are two Ṛikshas, two Parikshits, three Bhīmasenas, and two Janamejayas (excluding you, of course)."]

The lines given in the *Mahābhārata* in Chapters 94 and 95 do not stand this test. The lines given in the *Harivanśa* and in the *Vāyu Purāṇa* stand this test very well. But the line in the *Harivanśa* omits the famous king Hasti, who founded the city of Hastināpura. It, therefore, follows that the line, given in the *Vāyu Purāṇa*,[63] is the most reliable.

398. The following is the list of the kings in the *Vāyu Purāṇa*:—

1. Purūravas (पुरूरवस्)
2. Āyus (आयुस्)
3. Nahusha (नहुष)
4. Yayāti (ययाति)
5. Puru (पुरु)
6. Janamejaya (जनमेजय)

[62] Chapter 32.

[63] There is almost no difference between the lists in the *Vāyu Purāṇa* and in the *Vishṇu Purāṇa*.

7. Aviddha (अविद्ध)[64]
8. Praveera (प्रवीर)
9. Manasyu (मनस्यु)
10. Jayada (जयद)
11. Dhundhu (धुंधु)
12. Bahugavee (बहुगवी)
13. Sanjāti (संजाति)
14. Roudrāśva (रौद्राश्व)
15. Richeyu (रिचेयु)[65]
16. Rantināra (रंतिनार)
17. Trasu (त्रसु)
18. Malina (मलिन)
19. Dushyanta (दुष्यंत)
20. Bharata (भरत)
21. Vitatha (वितथ)
22. Bhuvamanyu (भुवमन्यु)
23. Bṛihatkshatra (बृहत्क्षत्र)
24. Suhotra (सुहोत्र)
25. Hasti (हस्ति)[66]
26. Ajameedha (अजमीढ)
27. Ṛiksha (ऋक्ष)
28. Samvaraṇa (संवरण)
29. Kuru (कुरु)
30. Parikshit (परिक्षित्)
31. Janamejaya (जनमेजय)
32. Suratha (सुरथ)
33. Vidūratha (विदूरथ)
34. Sārvabhouma (सार्वभौम)
35. Jayatsena (जयत्सेन)
36. Ārādhi (आराधि)

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[64] He conquered *Prachee*, the eastern direction.

[65] It appears, *Vāyu Purāṇa* calls him रजेयु also; other Purāṇas call him ऋचेयु (Ṛicheyu).

[66] He founded Hastināpura.

37. Ayutāyus (अयुतायुस्)
38. Akrodhana (अक्रोधन)
39. Devātithi (देवातिथि)
40. Ṛiksha (ऋक्ष)
41. Bhīmasena (भीमसेन)
42. Dileepa (दिलीप)
43. Prateepa (प्रतीप)
44. Śantanu (शंतनु)
45. Vichitra-Veerya (विचित्रवीर्य)
46. Pāṇḍu (पांडु)
47. Yudhishṭhira (युधिष्ठिर)
48. Abhimanyu (अभिमन्यु)
49. Parikshit (परिक्षित्)

399. The fact that Janamejaya the 31st king had six brothers named Kakshasena, Ugrasena, Chitrasena, Indrasena, Susheṇa, Bhīmasena, and several un-named others also, should be noted.[67] As shown before he is the king referred to in the *Śatapatha Brāhmaṇa.* It should also be noted that Śantanu, the 44th king, had a brother named Dewāpi, who was elder than Śantanu, but who having gone to the forest for religious austerities Śantanu became king.[68]

400. We have already determined the dates of the most important events in the life of the Pāṇḍavas. The date of the War between the Kauravas and the Pāṇḍavas is 1904·7 Kalpa Era and that of the end of the Yādavas and the Pāṇḍavas is 1926·7 Kalpa Era. These are fixed beyond doubt.

401. We shall now find out the date of Śree Kṛishṇa's birth because that will enable us to find out the date of Arjuna's birth also and because the date of Śree Kṛishṇa's birth as at present popularly known appears to be incorrect. It is obvious that the *Harivanśa* alone is the authority,

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[67] See verses 53–55 of *Ādi Parva*, Chapter 94.

[68] See *Vāyu Purāṇa*, Chapter 99, verse 236.

upon which we ought to rely in this matter and it says the following about the date of Śree Kṛishṇa's birth.

गर्भकाले त्वसंपूर्णे अष्टमे मासि ते स्त्रियौ ।
देवकी च यशोदा च सुषुवाते समं तदा ॥ ११ ॥
यामेव रजनीं कृष्णो जज्ञे वृष्णिकुलोद्भवः ।
तामेव रजनीं कन्यां यशोदाऽपि व्यजायत ॥ १२ ॥
नंदगोपस्य भार्यैका वसुदेवस्य चापरा ।
तुल्यकालं च गर्भिण्यौ यशोदा देवकी तथा ॥ १३ ॥
अभिजिन्नाम नक्षत्रं जयंती नाम शर्वरी ।
मुहूर्तो विजयोनाम यत्र जातो जनार्दनः ॥ १७ ॥[69]
नवम्यामेव संजाता कृष्णपक्षस्य वै तिथौ ।
अहं त्वभिजितो योगे निशायां यौवने स्थिते ॥ ३५ ॥
अर्धरात्रे करिष्यामि गर्भमोक्षं यथासुखं ॥ ३६ ॥[70]

[*Translation.*—" When the period of pregnancy was yet incomplete, *i.e.*, in the 8th month of pregnancy, the two women Devakee and Yaśodā, simultaneously gave birth to their children. Yaśodā gave birth to a girl in the same night, in which Śree Kṛishṇa was born. The one was the wife of Nanda Gopa and the other was the wife of Vasudeva. They were pregnant at the same time. The Abhijit was the constellation and Jayantee was the night and Vijaya was the Muhūrta, when Śree Kṛishṇa was born. (Śree Kṛishṇa says to the Goddess), ' You will be born of Yaśodā on the same 9th *Tithi* of a dark fortnight. I shall be born in the midnight, when there would be youth in the night, on the Yoga of Abhijit.' "]

402. The third, the eighth, or the 13th *Tithi* is called the Jayā or Jayantī.[71] This passage therefore, means that Śree Kṛishṇa was born in the eighth month of pregnancy at midnight on the night of the 8th *Tithi* of the dark half of a

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[69] *Vishṇu Parva*, Chapter 4, in the *Harivanśa*.
[70] *Vishṇu Parva*, Chapter 3, in the *Harivanśa*.
[71] See the dictionary named *Śabdakalpadruma*.

month, but during the 9th *Tithi*[72] and on the Abhijit constellation. The Abhijit is the first part of the Śravaṇa and the last of the Uttarāshāḍhā. We get such a combination on the 8th *Tithi* of the dark half of the Chaitra of the Anuvatsara 54 years before the Bhārata War. For, from this 8th *Tithi* to the Amāvāsyā of the Śrāvaṇa of the year of the War we have seven *Tithis* and 673 lunar months $(22 + 62 \times 10 + 32$ *minus* 1 for Kshayamāsa), *i.e.*, 20197 *Tithis* or 19881 days 25 Ghaṭees and 18¾ Palas; and as the Srāvaṇa Amāvāsyā of the year of the War ended at four days zero Ghaṭees, this 8th *Tithi* of the birth of Śree Kṛishṇa ended at two days 34 Ghaṭees 41¼ Palas. The constellation at the end of the Chaitra Amāvāsyā in the *Anuvatsara* is $6\frac{12}{124}$ from the beginning of the Dhanishṭhā.[73] Therefore, the constellation at the end of the previous 8th *Tithi* would be $26\frac{36}{124}$, *i.e.*, the beginning of the Śravaṇa, *i.e.*, the Abhijit. Therefore on the aforesaid date at midnight we have Navamī (9th *Tithi*) and also the Abhijit as required. This must, therefore, be the real date of the birth of Śree Kṛishṇa.

403. Śree Kṛishṇa was, therefore, 54 years old on the 8th of the dark half of the Chaitra of the year of the Bhārata War. Arjuna being of equal age must also have been 54 years old at the time of the battle described in the *Virāta Parva*. As Arjuna was 33 years old when he burnt the Khāṇḍava forest,[74] 21 years passed between the burning of the Khāṇḍava forest and the battle in the *Virāta Parva*, and therefore 21½ years passed between the burning of the forest and the Bhārata War. The date of the burning of the Khāṇḍava forest is, therefore, 1883·2 years Kalpa Era. The interval between the burning of the forest and the Bhārata War in turn confirms the date of the Bhārata War as shown below.

404. Chapter 225 of the *Adi Parva* shows that the Gāṇḍeeva bow was given to Arjuṇa by Varuṇa just before

[72] The wording " नवम्यामेव संजाता " shows that Śree Kṛishna also was born during the 9th *Tithi*.

[73] See Dixita, p. 78.

[74] See *supra*, para. 107.

and for the burning of the forest. Now, we have the following statement about this bow

एतद्वर्षसहस्रं तु ब्रह्मा पूर्वमधारयत् ।
ततोऽनंतरमेवाथ प्रजापतिरधारयत् ॥ ५ ॥
त्रीणि पंचशतं चैव शक्रोऽशीतिं च पंच च ।
सोमः पंचशतं राजा तथैव वरुणः शतम् ।
पार्थः पंच च षष्टिं च वर्षाणि श्वेतवाहनः ॥ ६ ॥
महावीर्यं महादिव्यमेतद्धनुरधारयत् ।
एतत्पार्थमनुप्राप्तं वरुणाच्चारुदर्शनम् ॥ ७ ॥[75]

[*Translation.*—" This bow was held by Brahmā for 1000 years, then by Prajāpati for 503 years, then by Indra for 80 years and 5 (months), then by Soma for 500, then by Varuṇa for hundred years and then by Pārtha for 65 years.

405. Supposing these years are from the beginning of the Vārāha Kalpa when Brahmā first assumed authority to the year of the Bhārata War, when the statement was made, we ought to get 1904·2 by the addition of these years. This however, we do not get. There must, therefore, be some mystery or mistake in this statement. Arjuna's years are clearly wrong as we have already shown before.[76] We have, therefore, to suppose as shown before that 21 years passed between the battle in the *Virāta Parva* and the burning of the Khāṇḍava forest. We have also seen that Indra ruled for 80 years only.[76a] We, therefore, take the words अशीतिं च पंच च to mean 80 years and 5 months. We shall also take it that the years of Soma and Varuṇa as given are double of what they actually were. We thus get the following calculation.

Brahmā	..	1000	Years	
Prajāpati	..	503	"	
Indra	..	80	"	and 5 months
Soma	..	250	"	
Varuṇa	..	50	"	
Arjuna	..	21	"	

[75] *Mahābhārata*, *Virāta Parva*, Chapter 43.
[76] See *supra*, para. 175.
[76a] See *supra*, para. 379.

The total of these years is 1904 years and 5 months, *i.e.*, 1904·4 years. About six months is the interval between the battle in the *Virāta Parva* and the Bhārata War. Therefore, from the beginning of the Vārāha-Kalpa to the War, we get 1904·9 years. This confirms the date of the Bhārata War found by us independently from astronomical data and also confirms the date of the burning of the Khāṇḍāva forest.

406. It should be noted that the Kurukshetra being contiguous to the Brahmāvarta, the territory of the Indra, the kings of the Kurukshetra often came into contact and even conflict at times with the Indra and the other functionaries of the Brahmāvarta. This did not happen so often with the kings of the other Ārya States. The burning of the forest was one of the conflicts between the Brahmāvarta and the Kurukshetra and was done for snatching the territory from the Brahmāvarta and for making it habitable.

407. The description of the third Janamejaya, *i.e.*, the great grandson of the Pāṇḍavas in Chapter 99 of the *Vāyu Purāṇa* is very important. It is as follows:

परिक्षितस्य दायादो राजासीज्जनमेजयः ।
ब्राह्मणान् स्थापयामास स वै वाजसनेयिकान् ॥ २५० ॥
अशपत्तं तदामर्षाद्वैशंपायन एव तु ।
न स्थास्यतीह दुर्बुद्धे तवैतद्वचनं भुवि ॥ २५१ ॥
यावत्स्थास्याम्यहं लोके तावन्नैतत्प्रशस्यते ।
अभितः संस्थितश्चापि ततः स जनमेजयः ॥ २५२ ॥
द्विरश्वमेधमाहृत्य ततो वाजसनेयकम् ।
प्रवर्तयित्वा तद्ब्रह्म...............॥ २५४ ॥

[*Translation.*—"The heir of Parikshita was Janamejaya. He established the Vājasaneyi Brāhmaṇas, the Brāhmaṇas who study Śukla Yajur Veda. Then Vaiśampāyana himself cursed him angrily, "Oh vile man, your order shall not stand (no body will obey your order). This will not be praised while I am living." Then Janamejaya died soon (अभितः) after twice performing the Aśvamedha and after

advancing the Vedas named Vājasaneya, *i.e.*, the Śukla Yajur Veda.

408. This shows that the Śukla Yajur Veda and the *Śathapatha Brahmaṇa* made by Yājñavalkya were supported and advanced by Janamejaya, in spite of the opposition of the orthodox school, headed by Vaiśampāyana. But as we know from the *Vāyu Purāṇa*, Chapter 61, verses 12 to 22 that Yājñavalkya was also a student of Vaiśampāyana, we have to conclude that the Śukla Yajur Veda and the *Śathpatha Brāhmana* were written during the reign of this Janamejaya.[77]

409. After Yudhishṭhira, Parikshit, the grandson of Arjuna who was born in the year of the War, became king. He was succeeded by his son Janamejaya the third, the most important events of whose reign have already been narrated above. He also had three brothers named Bhīmasena, Ugrasena and Śrutasena.[78] Twenty-four kings ruled after Janamejaya in Kurukshetra and then it was absorbed in the Magadha Empire.

410. We may consider here the date of the *Bhagavad-geetā* also. As we have already seen it refers to the four Manus (see *supra*, para. 390). This clearly shows that it was composed during the period of the four Manus, *i.e.*, from 1772 to 1992 Kalpa Era. But as it must have been composed after the Bhārata War, its date must be between 1904 and 1992 Kalpa Era. It may have been composed by Vyāsa himself or by Vaiśampāyana or by Souti. We will not, however, discuss this point here as it is outside the scope of our subject.

History of the Magadha

411. The Purāṇas say that Bṛihadratha of the line of Puru became king in the Magadha. The eighth from him was Jarāsandha, the contemporary of the Pāṇḍavas. Therefore, Bṛihadratha's date is about 1700 Kalpa Era. Second from Bṛihadratha is Ṛishabha.

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[77] See *supra*, para. 202.

[78] See *Ādi Parva*, Chapter 3.

412. We may here incidentally mention that a king named Ṛishabha has been referred to in the last Sarga of the *Uttara Kāṇḍa* of the *Rāmāyaṇa*; since after Śree Rāma the Pouranic lists of kings mention only one Ṛishabha, *i.e.*, the Ṛishabha in the line of Bṛihadratha, the Ṛishabha mentioned in the *Rāmāyaṇa* must be the Ṛishabha of the Bārhadratha line. This shows that the *Uttara Kāṇḍa* must have been composed after his time, *i.e.*, after about 1740 Kalpa Era, and that it is an interpolation.

413. The dual between Jarāsandha and Bhīmasena, in which Jarāsandha was killed is well known. Jarasandha's son Sahadeva was killed in the Bhārata War, fighting on the side of the Pāṇḍavas[79]; twenty-two Bārhadratha kings that ruled in the Magadha after him are given in the Purāṇas with the years of the reign of each. We have already shown that these years are twice of the actual years[80] and that these twenty-two kings reigned in all for 536 years. We have already given a list (named A) of these twenty-two kings.[81] The only modification that the list requires is that the years of Ayutāyus and Suchala have to be read as twenty-six and twenty-two respectively. If from this list we calculate the date of Śuchi it would be 2130 to 2159 Kalpa Era. We have seen that he had become the Indra in the last *i.e.*, the eleventh Manvantara.[82]

414. The following kings of the Pradyotana line reigned after the kings of the Bārhadratha line:

1.	Pradyota (प्रद्योत)	.. ..	11½ years
2.	Pālaka (पालक)	.. ..	12 „
3.	Viśākhayūpa (विशाखयूप)	.. ..	25 „
4.	Ajaka (अजक)	.. ..	10½ „
5.	Nandivardhana (नंदिवर्धन)	.. ..	10 „
	TOTAL	..	69 „

[79] See *Vāyu Purāṇa*, Chapter 99, verse 296.
[80] See *supra*, paragraphs 166, 171.
[81] See *supra*, para. 156.
[82] See *supra*, para. 393.

We have seen that the years of these kings as given in the Purāṇas are double of what they actually were.[80]

415. The following Śaiśunāga kings ruled after the Pradyotana kings:—

1.	Śiśunāga (शिशुनाग)	.. ..	20 years
2.	Kākavarṇa (काकवर्ण)	.. ..	18 „
3.	Kshemavarmā (क्षेमवर्मा)	.. ..	10 „
4.	Kshatroujas (क्षत्रोजस्)	.. ..	20 „
5.	Darśaka (दर्शक)	.. ..	17½ „
6.	Bimbisāra (बिंबिसार)	.. ..	19 „
7.	Ajātaśatru (अजातशत्रु)	.. ..	17½ „
8.	Udayee (उदयी)	.. ..	16½ „
9.	Nandivardhana (नंदिवर्धन)	.. ..	20 „
10.	Mahānandi (महानंदि)	.. ..	21½ „
	TOTAL	..	180 „

We have seen that the years of these kings also as given in the Purāṇas are double of what they actually were. In placing Darśaka as the fifth king we have followed the order of the Bouddha work *Mahāvanso.*

416. The Nandas reigned for 100 years after the Śaiśunāga kings. Chandragupta then reigned for 24 years and Bindusāra for 28 years and after him Aśoka came to the throne. We have also seen that Chandragupta was crowned king in 312 B.C. and that 218 years passed between Buddha's Nirvāṇa and Aśoka's coronation. The date of Buddha's Nirvāṇa must, therefore, be 478 B.C. (312–24–28 + 218).

417. We may here consider another important date namely that of the birth of Vyāsa, the author of the *Bhāgavata,* a person distinct from the grandfather of the Pāṇḍavas. This Vyāsa gives the date of his birth in the passage : द्वापरे

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[80] See *supra,* paragraphs, 166–71.

समनुप्राते तृतीये युगपर्यये already discussed.[83] This date is 2700 Kalpa Era. This is confirmed by the fact that in "आरभ्य भवतोजन्म" etc. (already discussed)[84] he gives the total of years from the Bhārata War to the Nandas only, thus showing that he must have lived in the reign of the Nandas. We have seen that the date of birth of Vyāsa, the grandfather of the Pāṇḍavas, is 1808 to 1812 Kalpa Era. These two different dates themselves show that the two Vyasas were distinct persons. There is evidence, which we cannot discuss here, to hold that this author of the *Bhāgavata* composed the *Śānti Parva* and the *Anuśāsana Parva* of the *Bhārata* and re-edited the whole *Bhārata* again. This date of the author of the *Bhāgavata* also explains the following verse pointed out to me first by Mahāmahopādhyāya Prof. Mirasi during the discussion following my lectures. "संधिरेष नरव्याघ्र त्रेतायाः द्वापरस्य च ॥ १० ॥" (*Vana Parva*, Chapter 121).

[*Translation.*—"This is the interim between the Tretā and the Dwāpara."] If the second Vyāsa be supposed to have interpolated this passage in the *Vana Parva*, he might easily be supposed to have also inadvertently given here his own date 2700 Kalpa Era, *i.e.*, the interim between the Tretā and the Dwāpara.

THE DATE OF THE VEDAS

418. We shall now take up the question of the date of the Vedas. In doing this we are not transgressing the limits of our subject for we are not here considering the entirely different question as to whether the Vedas are divinely inspired or are created by human intellect. Divine inspiration or creation by human intellect are both occurrences in time and we are only considering here the date of that occurrence.

419. We have already shown that Ṛik, Yajus and Sāman hymns were composed regularly in every quaternary for being sung in the Aśvamedha. Now the question is

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[83] See *supra*, para. 342.
[84] See *supra*, para. 162 *a*.

when did this process begin and how long did it continue? The obvious answer is that the process was going on so long as the Aśvamedha was being performed. But it may be that the Aśvamedha continued to be performed without the composing of new hymns and thus the question becomes complicated. The *Vāyu Purāṇa* gives the description of the Indra's Aśvamedha performed during the period of the Swāyambhuva Manu.[85] There it is stated that before performing the Yajña, hymns were designed

(मंत्रान् संयोजयित्वाऽथ इहामुत्रेषु कर्मसु ॥ १० ॥)

This shows that new hymns were composed at this time. But the Swāyambhuva Manu did not devise a new plan of the Yajña but only revived that of the Brahmā Ānanda.[86] It follows that the system of the Aśvamedha and the composing of the Vedas must have begun at *the latest* in the time of Ānanda Brahmā, *i.e.*, in 3102 B.C. This system might have begun earlier, Ānanda having borrowed it from some previous system. The latest date of the beginning of the composing of the Vedas is, therefore, 3102 B.C.

420. How can we know the date when the Vedas ceased to be composed? By ascertaining the latest historical person referred to in the Vedas we can know the earliest date when the Vedas ceased to be composed. Such a person is Devāpi, the brother of King Śantanu of Hastināpura. Both the brothers are referred to in Maṇḍala 10, Sūkta 98 of the Ṛigveda.

421. The Sūkta does not say who Devāpi and Śantanu were but only purports to say that Śantanu chose Devāpi as his priest and Devāpi prayed to the Gods to send rains for Śantanu. But the Nirūkta mentions that they were brothers born in the line of Kuru (2-10). We can, therefore, hold that the Sūkta refers to Śantanu the ancestor of the Pāṇḍavas.

[85] Chapter 57.
[86] See *supra*, paragraphs 362-65.

422. No later historical person is referred to in the Vedas. Veda Vyāsa, the grand father of the Pāṇḍavas, is said to have prepared the Samhitas of the three Vedas.[87] That may mean that the composition of new hymns was stopped before the time of Vyāsa. The time of Devāpi and Śantanu is almost that of Vyāsa. It, therefore, follows that the Vedic hymns were being composed at least between 3102 B.C. and 1300 B.C., *i.e.*, for at least a period of 1800 years.

423. Few would controvert this proposition. But such an indefinite proposition does not help us much. We ought to find some means of making it more definite. The *Gavam Ayanam* of Śyāma Śastree may help us here. He suggests on the authority of a passage in the *Aitareya Āraṇyaka* that while composing new hymns, the days of every year elaspsed from the commencement of the reckoning of time, of course, of the system of Yugas, *i.e.*, from the beginning of the system of the Yajñas, were represented by an equal number of letters, *i.e.*, each day by one consonant and one vowel.

That passage in the *Aitareya Āraṇyaka* is this:—

तद्वा इदं बृहतीसहस्रं संपन्नं तस्य वा एतस्य बृहतीसहस्रस्य संपन्नस्य षट्त्रिंशदक्षराणां सहस्राणि भवंति तावंति शतसंवत्सरस्याह्नां सहस्राणि भवंति व्यंजनैरेव रात्रीराप्नुवंति स्वरैरहानि ॥[88]

[*Translation.*—" Thus we obtain a thousand of Bṛihatees. The letters of this thousand of Bṛihatees are 36000 and so many also are the days of one hundred years. (The worshippers when meditating) fill the days with vowels and the nights with consonants."]

Though this advice is meant only for the worshippers, one may infer from it that the composers of the hymns also did represent each day by one letter (syllable). As the

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[87] *Mahābhārata, Ādi Parva*, Chapter 63, verse 88; Chapter 105, verse 15.

[88] *Aitareya Āraṇyaka*, Āraṇyaka 2, Chapter 2, Kāṇḍa 4.

Vedas were composed regularly every fourth year, there was most probably some proportion between the days of the year and the letters of the Vedas, and one letter for one day is a very probable proportion. This is supported by the construction of the word वेदप्रमाणेन given in *supra*, paragraph 359. That construction shows that the Yajña was to be proportionate to the Vedas and this evidently means that the letters in the Vedas were to be proportionate to the days of the Yajña, *i.e.*, the year. The word वेदप्रमाणेन can be construed otherwise also. But the construction given in paragraph 359 is more probably correct in view of the fact that the Vedas were composed regularly every fourth year, and that, therefore, there was very probably some proportion between the letters of the Vedas and the days of the year. Thus we can take it that one letter in Ṛigveda represents a day; 1460 days would thus represent a quaternary, the Vishuvān being omitted as the verse चत्वारिंशत्सहस्राणि शतान्यष्टौ च विषुतः, etc. discussed in the previous Lecture suggests.[89] As the Ṛigveda is said to contain 432000 letters in the passage in the *Śatapatha Brāhmaṇa*[90] already referred to in the previous chapter,[91] and as even now it contains about 4 lakhs and ten thousand letters approximately obtained by actual calculation from data given on pages 69–71 of C. V. Vaidya's *History of Sanskrit Literature*, it follows that the period during which the Vedas were being composed is not much longer than 1184 years.

424. But we have seen that the Vedas were being composed for at least 1800 years between 3102 and 1300 B.C. This may be explained by supposing that there were interruptions or breaks for some years in the composing of the Vedas. There may have been a break for 300 years before the Swāyambhuva Manu when there was a republic and there may have been breaks during other times also that

[89] See *supra*, para. 293.
[90] Kāṇḍa 10, Chapter 4, Brāhmaṇa 2.
[91] See *supra*, para. 270.

we do not know. The supposition of such breaks, however, again makes the period during which the Vedas were being composed indefinite. Here the statement that the system of the Yajña in which the Vedas were devised to be proportionate to the days of the year, was created at the end of the Divine Yuga, comes to our help (see *supra*, para. 359). That statement shows that the system must have been created in 3102 B.C., at the end of the Divine Tretā or in 6102 B.C. at the end of the Divine Kṛita or in 10102 B.C. at the end of the previous Divine Kali. There is no internal evidence in the Vedas to support the dates 6102 B.C. or 10102 B.C. or dates more ancient than these. On the whole, then we can safely say that Ṛigveda was being composed regularly every fourth year, most probably, between 3102 B.C. and 1300 B.C. with breaks.

This conclusion about the date of the Ṛigveda, applies to the other two Vedas also. For, we know that all the three Vedas were being composed simultaneously.[92]

425. Lokamānya Tilak has tried in his *Orion* to prove that the date of the Vedas is 4000 B.C. and even earlier. That conflicts with the above conclusion. It is, therefore, necessary to point out here certain flaws in the reasoning of Lokamānya Tilak.

426. About the three different beginnings of the year as mentioned in the *Taittirīya Samhitā* (7. 4. 8) Lokamānya Tilak says, "(3) as there cannot be three real beginnings of the year at an interval of one month each, the passage must be understood as recording a tradition about the Chaitrī Full Moon and the Phālgunī Full Moon being once considered as the first days of the year" (*Orion*, p. 54) and taking Phālgunī Full Moon to be the beginning of the year he infers that the Equinox was then in the Mṛiga. He assumes, in making this inference, that there could have been only one beginning of the year and assumes further that the year must have begun at the Winter Solstice.[93]

[92] See *supra*, paragraphs 269-74.
[93] Page 69.

427. Both these assumptions are unfounded. In the first place, the year has no natural beginning. We fix a beginning by convention and we do fix several beginnings of the year for different purposes. Even at present we have one beginning for financial purposes and another for other purposes. Lokamānya Tilak himself says in the *Orion*[94] "the Ancient Āryas after shifting the commencement of the year to the Winter Solstice, managed to keep up the old and the new system together by assigning the different beginnings of the years to different purposes." In the second place, there is no justification for the assumption that the year must have begun at the Winter Solstice. The *Taittirīya Sanhitā* says:—

उभयतोमुखं ऋतुपात्रं कोहि तद्वेद यदृतूनां मुखम् ।[95]

[*Translation.*—" The season vessel has openings on both sides who can know what is the opening (beginning) of the seasons."] The year in the *Vedānga-Jyotisha* begins with the Winter Solstice. But the *Taittīriya Brāhmaṇa* says :—

मुखं वा एतदृतूनां यद्वसंतः ॥[96]

[*Translation.*—"Vasanta is the beginning of the seasons, *i.e.*, the Vernal Equinox is the beginning of the seasons."]

Thus the beginning of the year is quite uncertain.

428. Thus there is no certainty that the beginning of the year at the Phālgunī Full Moon means a beginning at the Winter Solstice. On the contrary, the beginnings of the Yugas given in the *Prajāpati Śmriti* and discussed in the previous Lecture[97] show that the year began two months before the Summer Equinox.

It follows that the beginning of the year at the Phālgunī Full Moon, occurred one month after the Winter Solstice

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[94] See *Orion*, p. 26–31.
[95] 6. 5. 3.
[96] 1. 1. 2.
[97] See *supra*, paragraphs 321–36.

while Lokamānya Tilak thought that it occurred at the Winter Solstice. Thus Lokamānya Tilak made a mistake of 30 days in the beginning of the year and therefore of 30 × 72, *i.e.*, 2160 years in calculating the date of the Vedas.

429. The statements in the *Vṛishakapi Sūkta*[98] and *Ṛibhu Sūkta*[99] can be explained even on the supposition that the Equinox was in the Rohiṇi (रोहिणी) constellation. For when the Sun would be in the Rohiṇī whose longitude is 50°, the Mṛiga whose longitude is 60° would also become invisible and that is all that the *Vṛishakapi Sūkta* requires.[100] The *Ṛibhu Sūkta* means that the Star Sirius (श्वान) was seen in the West at the time of the sunset, when the Sun was in the Equinox. This is also possible when the Equinox is in the Rohiṇī; for the longitude of Sirius is 80° and the latitude is 40° South and the longitude of Rohiṇī is 50°. These Sūktas can thus be explained even on the assumption that the Equinox was then in the Rohiṇī. This gives us 3102 B.C. as the date of these Sūktas.

430. Even the name 'Āgrahāyaṇee'[101] given to the Mṛiga does not help Lokamānya Tilak very much. It only shows that the year then commenced with the Sun in the Mṛiga and that the Equinox was then in the Mṛiga. But that does not show that the sacrificial system that required the composing of the Vedas was then in vogue.

431. The date of the Vedas was always a vexed question and was shrouded in mystery. But if we first determine as we have done already the dates of important historical persons mentioned therein, it becomes most easy. The historical persons referred to in the Vedas belong to the period between 3102 B.C. and 1300 B.C. We have already spoken of Devāpi and Śantanu referred to in the Ṛigveda 10–98. Agastya and his wife Lopāmudrā have been referred

[98] Maṇḍala 10.
[99] Maṇḍala 1.
[100] See page 193 of *Orion*.
[101] *I.e.*, a star at the beginning of the year.

to in the Ṛigveda 1–179. This Agastya was a contemporary of Śree Rāma.[102] The Sāvarṇi Manu, the 8th, has been referred to in the Ṛigveda 10–62. His date has been found by us to be Kalpa Era 1424. Yayāti, the son of Nahusha has been referred to in the Ṛigveda 1–31; and 10–63. Yayāti's son Puru has also been referred to in the Ṛigveda 6–46. All these being descendants of Purūravas must belong to 1000 to 1100 Kalpa Era. Purūravas himself, described as the son of Ilā (ऐल), has been referred to in the Ṛigveda 10–95. The Vaivasvata Manu, the Ṛishi, *i.e.*, the author of the Ṛigveda 8–30, refers to another earlier Manu as (पिता) 'father' and prays that he may not deviate from the path of that Manu. This reference must be to the Swāyambhuva Manu. Manu has been referred to in the Ṛigveda 8–52, 1–80, 1–114, 2–33 as 'father'. These references must also be to the Swāyambhuva Manu. Pṛithee as the son of Vena has been referred to in the Ṛigveda 8–9. Manu is referred to as the first sacrificer in the Ṛigveda 10–63. This reference is evidently to the Swāyambhuva Manu for we have shown that the Swāyambhuva Manu revived the sacrificial system of the Brahmā who was the first creator of that system. All these persons referred to in the Ṛigveda belong to the period from 3102 to 1300 B.C.

432. That the sacrificial system of Manu was first created by Ānanda Brahmā about the year 3102 B.C. is supported by the statement in the *Taittirīya Brāhmaṇa.*

(प्रजापतिः रोहिण्यामग्निमसृजत । तं देवा रोहिण्यामादधत)

already referred to.[103] No attention has so far been paid to this statement. The reason for creating or consecrating fire on the Rohiṇī can be nothing else than that the Rohiṇī was then the first constellation of the year, *i.e.*, the Vernal Equinox was then in the Rohiṇī. This was a time much later than the so-called *Orion* Period. The Mṛiga has never been directly referred to by the Vedas as the first constellation of the year.

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[102] See *Rāmāyaṇa, Āraṇya Kāṇḍa*, Sarga 12.

[103] See *supra*, para. 358.

That it was the first constellation of the year when the Vedas were being composed, was only an inference of Lokāmanya Tilak and the flaws in that inference, we have seen already. In this passage, however, the Rohiṇī has been referred to directly. The Devatā of the Rohiṇī is Prajāpati, *i.e.*, the year, while that of the Mṛiga is Soma. This clearly shows that the sacrificial system requiring the composing of the Vedas must have been created when the Equinox was in the Rohiṇī, *i.e.*, in or about 3102 B.C. We are thus led to the conclusion that the composing of the Vedas must have begun in 3102 B.C. and not earlier. The most reliable date of the Vedas is, therefore, 3102 B.C. to 1300 B.C. All mystery about the date of the Vedas is thus removed.

We shall now determine the date of the *Gautama Smṛiti.*

GOUTAMA SMṚITI

433. The date of this Smṛiti has got much importance as it is the earliest of all the Smṛitis now available and was thus the first of the Smṛitis composed by private persons, persons other than the public authorities namely the Manu and the Saptarshis. This date is determined by the following statement in the same:

" श्रवणादि वार्षिकं प्रोष्ठपदीं वोपाकृत्याधीयीत छंदांस्यर्धपंचमान् पंच दक्षिणायनं वा '

(Chapter 16)

[*Translation.*—" The Upākaraṇa (taking up of the Vedas for study) should be performed from the Śravaṇa constellation of the rainy season or on the Paurṇimā of the *Bhādrapada*, *i.e.*, between the Śravaṇa constellation and the Paurṇimā of the Bhādrapada and then one should study the Vedas for four months and a half or for five months or for the whole of the Dakshiṇāyana."]

The rainy season means the months of Śrāvaṇa and Bhādrapada; for even in the days of the *Vedānga-Jyotisha* they were the months of Varshā or Rains. The passage, therefore, means that Upākaraṇa is to be performed from the Śravaṇa constellation in the month of the Śrāvaṇa, *i.e.*, from

the Paurṇimā in the Śrāvaṇa to the Paurṇimā in the Bhādrapada and that there was Dakshiṇāyana even on the Paurṇimā of the Śrāvaṇa. The Śravaṇa is 286½° from the Zeta Piscium at which the Equinox stood in the year 497 of the Saka Era or 575 A.D. In the beginning of the Dakshiṇāyana the longitude of the Sun from the Equinox ought to be 270°. Therefore 16½° was the distance of the Equinox from the Zeta Piscium at the time of the *Goutama Smṛiti.* The Equinox goes back one degree in 72 years. Therefore, the earliest date of the *Goutama Smṛiti* must be 16½ × 72, *i.e.*, 1188 years before 575 A.D., *i.e.*, 613 B.C. or 2489 Kalpa Era. This means that the Smṛiti was written in the Tretā Yuga of the third revolution of the Yugas. This agrees with the following statement in the *Pārāśara Smṛti.*

कृते तु मानवा धर्मास्त्रेतायां गौतमाः स्मृताः ।
द्वापरे शंखलिखिताः कलौ पाराशराः स्मृताः ॥

[*Translation.*—" The Dharmas (rules of conduct) in vogue in the Kṛita were those declared by Manu; those in vogue in the Tretā Yuga were the Dharmas declared by Goutama; those in vogue in the Dwāpara were the Dharmas declared by Śankha and Likhita; and those in vogue in the Kali were the Dharmas declared by Pārāśara.] If we construe this passage according to the Human System of the Yugas, it means that the rules of Manu were in vogue between the Kalpa Era 2000 to 2400 and those of the Goutama between the Kalpa Era 2400 and 2700, etc. This affords confirmation of our calculation that the *Goutama Smṛiti* was compiled in the Tretā Yuga. It should be noted that the *Manu Smṛiti,* referred to in this passage, is not what we have to-day; but a previous edition of the same, well known to the students of the Smṛiti literature.

434. We have finished. As proposed we have determined the dates of the major events and the dimensions and the starting point of the Yugas (cycles). These have been then used for unravelling the chronology of Pre-Mauryan history as narrated in ancient historical works. We have thus tried to

evolve an order out of what appeared a chaos and what always baffled and disappointed a truth-seeking historian. We hope this will help all historians, namely historians of Politics, Social Affairs, Dharma, Science, Literature, Philosophy or Arts in Āryan India; and our labours will be well rewarded if such historians consider and make proper use what we have set forth in these lectures.

APPENDIX A

THE MYSTERY OF GARGA'S DATE OF THE PĀṆḌAVAS

(See Paragraphs 184-191)

This date is based mainly upon the misunderstanding of the following verses in the *Vāyu Purāṇa* in Chapter 99:—

आंध्राणां संस्थिताः पंच तेषां वंशाः समाः पुनः ॥
सप्तैव तु भविष्यंति दशाभीरास्ततोनृपाः ।
सप्त गर्दभिनश्चापि ततोऽथ दश वै शकाः ॥ ३५९ ॥

The reading of these verses in the *Matsya Purāṇa* in Chapter 273 is as follows:—

आंध्राणां संस्थिता राज्ये तेषां भृत्यान्वये नृपाः ॥ १६ ॥
सप्तैवांध्रा भविष्यंति दशाभीरास्ततो नृपाः ।
सप्त गर्दभिसश्चापि शकाश्चाष्टादशैव तु ॥ १८ ॥

The real reading appears to be:—

आंध्राणां संस्थिता राज्ये तेषां वंशाः समाः पुनः ॥
सप्तैवांध्रा भविष्यंति दशाभीरास्ततोनृपाः ।
सप्त गर्दभिनश्चापि ततोथ दश वै शकाः ॥

This really means " The dynasties contemporaneous with the reign of those Āndhras are seven Āndhras, ten Ābhīras, seven Gardabhins and ten Śakas ". But Garga, relying probably on the reading in the *Matsya Purāṇa* construed it to mean* that these dynasties succeeded the Āndhras who reigned for 456 years according to the *Vāyu Purāṇa* and of whom Puloman was the last. He added the years of all the dynasties previous to that of the Śakas mentioned in this verse and assuming that the reign of the Śakas began in the first year of the Śaka Era, found the date of the Pāṇḍavas. His calculation was like what is shown below:—

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* *Note.*—The literal translation can be as follows:—In the territory of those Āndhras, stood kings in the line of their ministers (भृत्य). These will be seven Āndhra kings, then ten Ābhīra Kings, seven Gardabhin Kings and then ten Śakas.

1,072	years	Bārhadratha	Kings
138	,,	Pradyotana	,,
360	,,	Śaiśunāga	,,
100	,,	Nanda	,,
137	,,	Maurya	,,
112	,,	Śunga	,,
456	,,	Āndhra	,,
52	,,	Seven Āndhra	,,
67	,,	Ten Ābhīra	,,
72	,,	Seven Gardabhin	,,
		(The Kaṇva Kings are omitted as being ministers and contemporaries of the Śunga Kings.)	
2,566	,,	TOTAL	

Here, it should be noted that the years of the seven Gardabhins are given by the verse:—

सप्तषष्टिं च वर्षाणि दशाभीरास्ततो नृपाः ।
सप्त गर्दभिनश्चैव भोक्ष्यंतीमां द्विसप्ततिः ॥

found in some books of the *Vāyu Purāṇa* (see Ānandāśrama Edition of the *Vāyu Purāṇa*) and the years of the seven Āndhras are given by the verse:—

आंध्राः श्रीपार्वतीयाश्च ते द्विपंचाशतं समाः ॥ २३ ॥

in Chapter 273 of the *Matsya Purāṇa*. That the Kanvas were contemporaries of Śungas is proved by verse 35 of Chapter 272 of the *Matsya Purāṇa* where the Kaṇva Kings are said to be servants (ministers) of the Śungas (शुंगभृत्य) and by verses 1 and 2 of Chapter 273 of the same where it is said that the Āndhra King also destroyed the remains of the Śungas (शुंगानां चैव यच्छेषं क्षपित्वा).

The total found by the calculation given above agrees with the number of years given by Garga. Kalhana did not know this calculation and therefore he construed Garga's verse to mean that 2,526 years passed from the Pāṇḍavas to the beginning of the Śaka Era. The mystery about Garga's date of the Pāṇḍavas is thus solved very clearly. This also shows that Garga found in the Purāṇas, the years of the Bārhadratha, Pradyotana, Śaiśunāga and Nanda Kings to be 1,072, 138, 360 and 100 years respectively and confirms our calculation in para 167.

APPENDIX B

THE DATE OF THE *MAITRYUPANISHAD*

Objection is taken by some to the date of the Mahābhārata War proved in these lectures, on the ground that the date of the Mahābhārata War is earlier than that of the *Maitryupanishad* and that the date of the *Maitryupanishad* is about 1900 B.C.

That the *Maitryupanishad* is later than the Pāṇḍavas is certain inasmuch as, it undoubtedly refers to certain passages in the *Chhāndogya Upanishad* (compare, for example, Prapāthaka 6, Khaṇda 2 of the *Maitryupanishad* and Chapter 7, Khaṇda 9 of the *Chhāndogya Upanishad*) which in its turn mentions the name of Dewakīputra Kṛishṇa in Chapter 3, Khaṇda 17. The date of the *Maitryupanishad*, moreover is said to be about 1900 B.C. from the following statement in it:—

"कालस्यैतद्रूपं यन्निमेषादिकालात्संभूतं द्वादशात्मकं वत्सरमेतस्याग्नेयमर्धमर्धं वारुणं मघाद्यं श्रविष्ठार्धान्तमाग्नेयं क्रमेणोत्क्रमेण सार्पाद्यं श्रविष्ठार्धांतं सौम्यं" (प्रपाठक ६, खंड १४).

[*Translation.*—"The year consisting of twelve months, is the figure of the *Kāla*, *i.e.*, Time formed by the Nimesha and other portions of Time. It (the year) consists of two parts, one Āgneya (relating to Fire) and the other Vāruṇa (relating to Water). From the Maghā to the middle of the Dhanishṭhā in the proper order is Āgneya (because man takes resort to fire to protect himself from cold in these days). From the Āśleshā to the middle of the Dhanishṭhā in the reverse order is Soumya (because man resorts to the Soma or the Moon in these days when troubled by the heat of the Sun)."]

This passage is said to show that the point of the Winter Solstice was in the middle of the Dhanishṭhā, at the time of the *Maitryupanishad* and that therefore the date of the *Maitryupanishad* must be about 1900 B.C. It follows, it is argued, that the date of the Mahābhārata War must be earlier than 1900 B.C., *i.e.*, about 700 years earlier than the date proved in these lectures.

The argument, however, obviously lacks logical stringency. The passage in question does not necessarily show that the

Maitryupanishad must have been composed as early as 1900 B.C. For, it is quite possible that the Upanishad though, as we shall presently show, it is a work of a comparatively recent date might yet describe astronomical phenomena of an epoch far earlier than the date of its composition. And, indeed, a careful examination of its structure reveals that it purports to describe a dialogue supposed to have taken place with Bṛihadratha, a descendant of Ikshwāku, the sixth in descent from Ikshwāku's son Nimi, who lived about 750 years earlier than the Pāṇḍavas. It is only natural, therefore, that consistently with its structural plan, such a work should mention in Prapathaka 1, Khaṇda 5, only those Kings who lived much earlier than the Pāṇḍavas and describe astronomical phenomena occurring in the time of Bṛihadratha. For this purpose it could have drawn upon the information available in the Purāṇas which were then extant and a reference to the *Vāyupurāṇa*, Chapter 50, verses 197–99, would seem to suggest that the astronomical information contained in the passage in the *Upanishad* might possibly have been taken from the *Vāyupurāṇa*. Authors are often known to do such things. Therefore it is certain that the objector's argument cannot possibly shake the conclusion that has been so rigorously arrived at in these lectures in respect of the date of the Mahābhārata War from far more reliable and unimpeachable astronomical data and the evidence of the Pourāṇic Dynasties between the War and Chandragupta Mourya.

We may point out by the by, that the date of the *Upanishad* must be subsequent to that of the Buddha. The language of the *Upanishad* is comparatively modern. The sage who is the preceptor of Bṛihadratha is named Śākāyanya and we know from the Purāṇas that the name of the grandfather of Buddha was Śākya and we know that Buddha himself was called Sākya-simha. Thus Śākāyanya may be but another name of Buddha. These facts go to show that this *Upanishad* was probably subsequent to the time of Buddha.

APPENDIX C

THE STARTING POINT OF THE DIVINE YUGAS

We have presumed in paragraph 347 that the starting point of the Divine Kali was the same as that of the third Human Kṛita. There is, however, in the *Bhāgavata Purāṇa*, an express statement about the starting of the Divine Kali. The *Bhāgavata* says in Skandha 12, Chapter 2:—

यस्मिन् कृष्णो दिवं यातस्तस्मिन्नेव तदाहनि ।
प्रतिपन्नं कलियुगमिति प्राहुः पुराविदः ॥ ३३ ॥

[*Translation.*—" The historians (पुराविदः) say that the Kali started on the very day on which Śree Kṛishṇa went to Heaven."]

It may be said that this is only a panegyric of Śree Kṛishṇa. But the word पुराविदः suggests that though undoubtedly a panegyric, this statement may have been based upon some fact. And indeed we know a fact which can be at the basis of this statement. Śree Kṛishṇa died 22 years after the Bhārata War, *i.e.*, in 1926·7 Kalpa Era or Kali Era (see *supra*, paragraphs 98, 99 and 338). The century of the Saptarshi Kāla started at the beginning of the 27th year of the Kali Era, *i.e.*, the Kalpa Era (see *Dixit*, page 373), *i.e.*, at 26 Kalpa Era. We have seen, however, in paragraphs 325 and 333 that the beginning of the year was shifted forward first by half of an year and then by two lunar months again, *i.e.*, in all by 7/10ths of an year. Therefore in the year of Śree Kṛishṇa's death, the first year of the century of Saptarshi Kāla must have begun at 1926·7 Kalpa Era. This agrees with the date of Śree Kṛishṇa's death. This agreement shows that there is a fact at the basis of the statements in the *Bhāgavata* and that fact is that the date of Śree Kṛishṇa's death and date of the starting of the century of the Saptarshi Kāla was the same. But the *Bhāgavata* calls this date, the date of the starting of the Kali, shown to be the Divine Kali by the word द्वादशाब्दशतात्मकः (the Kali of 1,200 years) in the preceding 31st verse of the same chapter. This shows that the Divine Kali, started in 1926·7 Kalpa Era. The Divine Dwāpara must therefore have started 74 years before the starting of the Vārāha

Kalpa (*i.e.*, before 3102 B.C.) taking the shifting of the beginning of the year into consideration. This is opposed to our presumption that the Divine Kali started in 2000 Kalpa Era and that therefore the Divine Dwāpara started at the beginning of the Kalpa Era. Our presumption was based upon the idea that the starting point of the Divine and the Human Yugas must be same and this idea does not appear to be incorrect. This opposition therefore suggests that the starting point of yugas was changed when in 3102 B.C. the conjunction of the planets in the Revati was seen and that the old starting point still survives in the shape of the starting point of the century of the Saptarshi Kāla. From this point of view, the starting point of the Divine Dwāpara would be 74 years before the starting of the Vāraha Kalpa in 3102 B.C., *i.e.*, 3176 B.C. and the starting of the Divine Kṛita 10176 B.C. The date of the habitation of the Meru by the ancestors of the Indian Āryas would therefore be 10176 B.C. instead of 10102 B.C. as settled in para. 353.

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